

START 3

Superfund Technical Assessment and Response Team 3 –
Region 8



United States
Environmental Protection Agency
Contract No. EP-W-05-050

ANALYTICAL RESULTS REPORT for SITE REASSESSMENT

UPPER ANIMAS MINING DISTRICT
Silverton, San Juan County, Colorado

TDD No. 1008-13

AUGUST 10, 2011



URS
OPERATING SERV

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Association with:

- TechLaw, Inc.
- LT Environmental, Inc.
- TN & Associates, Inc.
- Garry Struthers Associates, Inc.

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CERCLIS ID# CO0001411347

**EPA Contract No. EP-W-05-050
TDD No. 1008-13**

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08/16/11

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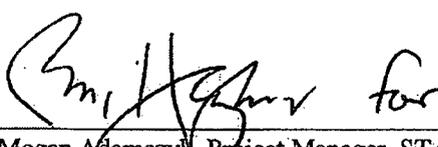


C. W. Baker, START 3 Program Manager, UOS

Date:

8/16/11

Approved:



Megan Adamczyk, Project Manager, START 3, UOS

Date:

August 10, 2011

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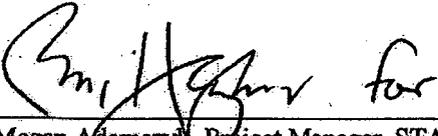
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**ANALYTICAL RESULTS REPORT
 for SITE REASSESSMENT**

**UPPER ANIMAS MINING DISTRICT
 Silverton, San Juan County, Colorado**

CERCLIS ID# CO0001411347

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1.0 INTRODUCTION

This Analytical Results Report (ARR) for the Upper Animas Mining District Site Reassessment (SR) in Silverton, San Juan County, Colorado, has been prepared to satisfy the requirements of Technical Direction Document (TDD) No. 1008-13 issued to URS Operating Services, Inc. (UOS) under the U.S. Environmental Protection Agency (EPA) Region 8 Superfund Technical Assessment and Response Team 3 (START) Contract No. EP-W-05-050. This report has been prepared in accordance with the EPA “Guidance for Performing Site Inspections under CERCLA,” Interim Final, September 1992, and the “Region 8 Supplement to Guidance for Performing Site Inspections under CERCLA” (EPA 1992, 1993). Field work at the Upper Animas Mining District site included a site reconnaissance in September 2010 and sampling activities which were conducted between October 25 and November 1, 2010. Site activities followed the Site Inspection (SI) format and the Generic Quality Assurance Project Plan and the applicable UOS Technical Standard Operating Procedures (TSOPs) (UOS 2005a, b).

The field activities conducted by UOS specifically included the collection of 54 surface water samples, 54 co-located sediment samples, and 14 source soil samples; these sample numbers include three surface water duplicate samples and three sediment field replicate samples collected as field Quality Assurance/Quality Control (QA/QC) samples (in addition to the three laboratory matrix spike/matrix spike duplicate [MS/MSD]) which did not count as additional samples (Table 1).

The soil and sediment samples were shipped under custody via FedEx to a Contract Laboratory Program (CLP), Routine Analytical Services (RAS) laboratory, ALS Laboratory Group in Salt Lake City, Utah. Soil and sediment samples were analyzed for Target Analyte List (TAL) metals and polychlorinated biphenyls (PCBs). Surface water samples were hand-delivered under custody to the EPA Region 8 Environmental Services Assistance Team (ESAT) Laboratory in Golden, Colorado. All surface water samples and aqueous source samples designated for dissolved TAL metals analysis were filtered in the field at the time of sample collection. Aqueous source samples (adit discharges) were also analyzed for unfiltered total TAL metals (see section 5.2.1 for further detail).

All analytical results were validated. Soil and sediment data was validated by Fred Luck and surface water and adit discharge samples were validated by Diane Short & Associates. No significant data quality issues were identified and the validation reports are presented under separate cover in Appendix B.

This ARR is intended to be used in conjunction with the Upper Animas Mining District Field Sampling Plan (FSP) that was approved by EPA on October 21, 2010, and the Upper Animas Mining District Trip Report presented in this report under separate cover as Appendix A (UOS 2010, 2011a).

2.0 OBJECTIVES

Previous investigations in the Upper Animas Mining District identified the tailings piles and adit discharges as sources of contamination, but did not yield conclusive information regarding possible migration of contaminants into the Groundwater, Surface Water, and the Soil Exposure Pathways. This SR was performed to determine if any contamination from the identified sources in Upper Cement Creek drainage in the Upper Animas Mining District area has migrated into the environment where it is impacting environmental and/or human health targets. The purpose of this SR was to gather information for the evaluation of this site with regard to the EPA's Hazard Ranking System (HRS) criteria (Office of the Federal Register [OFR] 1990). The specific objectives of this SR were:

- Document and evaluate source areas; including waste volumes;
- Document overland flow of water to Cement Creek;
- Evaluate targets for the groundwater, surface water, soil, and air pathways;
- Evaluate non-sampling data documenting past observed releases from site source areas;
- Collect surface water samples to document a release to Cement Creek and the Animas River;
- Collect sediment samples to document a release to Cement Creek and the Animas River;
- Document target locations for fisheries and wetlands;
- Document fisheries use;
- Collect soil (source) samples to characterize potential contaminants at the site and characterize the extent of surface soil contamination that may affect overland water flow to Cement Creek;
and
- Collect soil samples to characterize potential contaminants at the site and characterize the extent of surface soil contamination that may affect the nearby residents, Silverton Mountain workers, all-terrain vehicle (ATV) riders and other recreationalists.

3.0 SITE DESCRIPTION

Cement Creek originates high in the rugged San Juan Mountains of southwestern Colorado near the San Juan County and Ouray County line on the south slopes of Red Mountain Number 3 and the north slopes of Storm Peak. Cement Creek begins at an elevation of 13,000 feet above mean sea level (MSL) and

flows 7 miles southward to an elevation of 9,305 feet above MSL at its confluence with the Animas River at Silverton, Colorado (Figures 1 and 2) (Colorado Department of Public Health and Environment [CDPHE] 1998). The name Cement Creek probably refers to the iron rich precipitates (ferricrete) that coat and cement the stream bed materials (U. S. Geological Survey [USGS] 2007e). This investigation focused on the largest sources of unremediated mine waste and mine discharges in Upper Cement Creek (above Gladstone) including the American Tunnel (Appendix A, photos 27, 28, and 47), Gold King 7 Level Mine (Appendix A, photos 38 and 74), Red and Bonita Mine (Appendix A, photos 35, and 48-51), Mogul Mine (Appendix A, photos 46, 63, and 68-70), Mogul North Mine (also known as the Mogul Sublevel 1), and Grand Mogul Mine (Appendix A, photos 58-60 and 63-67). These mines and discharges will henceforth be referred to as the “upper Cement Creek mines” or “upper Cement Creek discharges.” The Queen Anne Mine, the Columbia Mine, and the Adelphin Mine are also potential sources in the area, but could not be addressed at the time of this investigation because they were inaccessible due to snow cover (Appendix A, photos 37, 56, and 57). This investigation also addressed potential PCB contamination in the sources and sediments of Cement Creek and the Animas River.

3.1 SITE HISTORY

The rugged and relatively inaccessible western San Juan Mountains were first prospected by the Baker party, which explored the area around Silverton in 1860. After a treaty with the Ute Indians was revised, mining began in 1874, and George Green brought the first smelter equipment into the area at Baker’s Park that year (Silverton Magazine 2009). The extension of the railroad from Silverton up Cement Creek to Gladstone in 1899 encouraged the mining of low grade ores, and the establishment of a lead-zinc flotation plant in 1917 allowed for the treatment of the low grade complex ores found in the area (USGS 1969). The last producing mine in the area was the Sunnyside Mine, which ceased production in 1991 (USGS 2007c). The closing of the Sunnyside mine occurred after Lake Emma drained into the mine and out the American Tunnel into Cement Creek in 1978. The flood water from the Lake Emma “blow-out” was reported to have flowed down Cement Creek in a 10-foot wall of water that would have transported a large quantity of tailings and other mine waste down Cement Creek to the Animas River (The Silverton Railroads 2009).

Over a 100-year period between 1890 and 1991, mining activities in the Upper Animas River Basin, including Cement Creek, produced the waste rock and mill tailings sources from which contamination spread throughout the Surface Water Pathway. Over 18 million tons of ore were mined from the Upper Animas River Basin area, with more than 95 percent of this being dumped

directly into the Animas River and its tributaries in the form of mill waste. Older waste rock piles and stope fillings were reworked and sent to mills as technology allowed lower grade ores to be economically processed. A great deal of abandoned waste was also milled during World War II when many older mining and milling structures were cannibalized for scrap metal. The history of mining and milling in the Cement Creek area can be divided into four eras, each of which produced different types and volumes of mine wastes.

- Phase 1 The Smelting Era (1871-1889). Mines were usually small, mining was done by hand, milling was rarely done, and small amounts of often highly mineralized rock were left in surface dumps. Zinc minerals were preferentially removed from the ore and left in mine dumps because zinc created problems during the smelting process. Total production of the entire Upper Animas River area during this era is estimated to be 93,527 short tons. Very little mine or mill tailings were directly discharged into the area streams (USGS 2007c).
- Phase 2 The Gravity Milling Era (1890-1913). Federal government support coupled with the introduction of higher capacity mining and milling techniques encouraged the mining of lower grade ores. Milling became the predominant ore processing method as ore values dropped and tonnage increased. Large volumes of mine and milling wastes were discharged directly into streams. Gravity mills recovered as much as 80 percent of the metals; however, zinc, iron pyrite, and some copper compounds were not recoverable, and when discharged into the streams, were easily spread downstream throughout the environment. Between 1890 and 1913 the total production of the entire Upper Animas River area was estimated at 4.3 million short tons (USGS 2007c). Approximately 95 percent of the waste generated during this era was discharged directly into the area streams (USGS 2007c).
- Phase 3 The Early Flotation Era (1914-1935). The increased demand for metals caused by World War I further accelerated the trend to larger scale mining and milling in the area. Ball mill grinding and froth flotation for concentrating ores were introduced, and again most mill tailings were dumped directly into area streams. During this era total production of the entire Upper Animas River area was estimated at 4.2 million short tons, of

which only 36,232 short tons were shipped out of the area to be smelted (USGS 2007c).

- Phase 4 The Modern Flotation Era (1936-1991). Mining almost came to a halt during the Great Depression, but mining activity resumed during World War II when many mines and mills were reopened with substantial support from the federal government. In addition to the newly mined material, waste rock from abandoned mines, in both the waste dumps and the old underground stope fills, was reclaimed and processed. Mining and milling processes improved in detail, but still used familiar technology. The major change was the impoundment of mill tailings that began as a result of a 1935 Colorado Supreme Court ruling that required operations to contain mill tailings. Some early attempts to contain mill tailings were not completely successful and resulted in catastrophic releases of mill tailings to area streams. Mining and milling in the Upper Animas River area had substantially decreased by 1953, and all mining and milling activity ceased in 1991. During this era total production of the entire Upper Animas River area was estimated at 9.5 million short tons. All mill tailings were impounded in settling ponds except for an estimated 200,000 short tons of mill tailings that were released into the Animas River area streams. Ore shipments to smelters totaled only 8,148 tons out of the 9.5 million short tons of production during this final era (USGS 2007c).

Reclamation activities have been ongoing in the Cement Creek basin since 1991 when tailings were removed from the Lead Carbonate Mill site. Reclamation work has also been conducted in Gladstone at the American Tunnel waste dump and portal, Herbert Placer settling ponds, and the Gold King 7 Level Mine. Downstream of Gladstone on Prospect Gulch, several mine sites have been remediated, including the Galena Queen Mine, Hercules Mine, Henrietta Mine, and most recently at the Joe and John Mine and the Lark Mine in 2006 and 2007 (Animas River Stakeholders Group [ARSG] 2007). No new reclamation activities were initiated in 2008 or 2009, but in 2010 the EPA initiated a removal assessment at the Red and Bonita Mine. EPA and the Bureau of Land Management (BLM)/U.S. Department of Agriculture (USDA)-Forest Service are also investigating the viability of removal assessments at the Grand Mogul Mine, which consists of both privately and federally-managed parcels.

3.2 SITE CHARACTERISTICS

3.2.1 Physical Geography

The Cement Creek drainage of the Upper Animas Mining District site is located north of the Town of Silverton, Colorado and is located on a combination of public and private property. The site is located in mountainous terrain and the elevation of the Cement Creek drainage ranges from 9,305 to 13,000 feet above MSL (USGS 1955).

3.2.2 Geology

The Cement Creek basin is located in the volcanic terrain of the San Juan Mountains. The area was a late Oligocene volcanic center where the eruption of many cubic miles of lava and volcanic tuffs covered the area to a depth of more than a mile (USGS 1969). The formation of the 10-mile diameter Silverton caldera produced faults that are generally concentric circular features. The caldera collapse was followed by multiple episodes of hydrothermal activity that produced widespread alteration and mineralization of the rocks (USGS 2007a). Cement Creek flows through the middle of the old Silverton caldera (EPA 1999).

The predominant rock type found in the Cement Creek Basin is the Oligocene Age Silverton Volcanics. The Silverton Volcanics are lava flows of intermediate to silicic composition and related volcanoclastic sediments that accumulated to a thickness of approximately 1,000 feet around older volcanoes prior to the subsidence of the Silverton Caldera (USGS 2002).

The regional propylitization of the rocks in the area prior to the collapse of the calderas created an altered regional rock type that contains significant amounts of calcite (CaCO_3), epidote ($\text{Ca}_2\text{Fe}(\text{Al}_2\text{O})(\text{OH})(\text{Si}_2\text{O}_7)(\text{SiO}_4)$), and chlorite ($(\text{MgFeAl})_6(\text{SiAl})_4\text{O}_{10}(\text{OH})_8$), all of which contribute to the intrinsic acid-neutralizing capacity of the major regional rock type. Three major areas of post-caldera collapse mineralization and alteration have been identified in the Cement Creek drainage. The Ohio Peak-Anvil Mountain (OPAM) area on the west side of the lower Cement Creek drainage and the Red Mountains area on the northwest side of the upper Cement Creek drainage are both sites of 23-million-year-old acid-sulfate mineralization. The Eureka Graben area on the upper northeast side of the Cement Creek drainage is the site of 10- to 18-million-year-old emplacement of

northeast-trending polymetallic veins of silver, lead, zinc, copper, and often gold that formed as fracture or fissure filling material (USGS 2007d).

The Red Mountain and OPAM acid-sulfate hydrothermal systems cover 22 square kilometers and 21 square kilometers, respectively, along the margin of the collapsed Silverton Caldera on the west and northwest side of the Cement Creek Drainage (Figure 2). Most of the mineralization and mining activity in these two areas has occurred in the Red Mountain area with mines and adits related to the Red Mountain acid-sulfate system found in Prospect, Dry, Georgia, and Corkscrew Gulches, all tributaries of Cement Creek. The ores from these mines commonly contain enargite (Cu_3AsS_4), galena (PbS), chalcocite (Cu_2S), tetrahedrite ($(\text{Cu,Fe})_{12}(\text{Sb,As})_4\text{S}_{13}$), stromeryite (AgCuS), bornite (Cu_5FeS_4), chalcopyrite (CuFeS_2), and pyrite (FeS_2) along with elemental arsenic (As), copper (Cu), lead (Pb), and iron (Fe) (USGS 2007d).

Mineralization in the veins of the Eureka Graben area that is drained by upper Cement Creek include massive pyrite and milky quartz ($\text{FeS}_2\text{—SiO}_2$), chalcopyrite (CuFeS_2), galena (PbS), sphalerite (ZnS), fluorite (CaF), and elemental gold (Au) and silver (Ag) (USGS 2007d).

The San Juan Mountains were nearly covered by alpine glaciers during the latest Pleistocene Pinedale glaciation. The thickness of glacial ice is estimated to have ranged from approximately 1,400 feet thick at Gladstone to 1,700 feet thick at Silverton. The Pinedale glaciation ended approximately 12,000 years ago and, except for the glacial till deposits, all surface sediments along Cement Creek were likely deposited after that time (USGS 2007e). Recent human activities have had relatively little influence on the overall shape and physical processes of Cement Creek (USGS 2007e).

3.2.3 Hydrogeology

Approximately 6,000 years ago, Cement Creek cut into the creek bed sediments by as much as 16 feet, causing a drop in the valley bottom shallow water table aquifer. Beginning about A.D. 400, Cement Creek aggraded the stream bed by as much as 10 feet, then between A.D. 1300 and A.D. 1700, Cement Creek cut back to the previous level established approximately 6,000 years ago. These changes in the shallow water table

elevations in the valley caused mineralization and cementation of the sediments in the stream course (USGS 2007e).

Groundwater in the Cement Creek area is found in cracks and fissures in the near surface of the igneous rocks that comprise the majority of the area (USGS 2007e).

3.2.4 Hydrology

The drainage area of Cement Creek is 20.1 square miles (USGS 2007b). Cement Creek flows through the middle of the old caldera, with the period of high flow being May, June, and July in response to snowmelt in the San Juan Mountains, and the periods of low flow occurring in later winter and late summer (EPA 1999). The average flow measured by the USGS on Cement Creek at Silverton before the confluence with the Animas River at station number 09358550 (also known as CC48) between 1992 and 2008 (excluding 1994) was 38.3 cubic feet per second (cfs). The highest average flow on Cement Creek was 56.3 cfs during 1995 and the lowest was 17 cfs during the drought of 2002 (USGS 2009). The drainage area of the Animas River is 146 square miles (USGS 2007b). The average flow measured by the USGS on the Animas River below Silverton at station number 09359020 (also known as A72) between 1992 and 2008 was 281 cfs (USGS 2009).

3.2.5 Meteorology

The Upper Animas River Basin and Cement Creek are located in an alpine climate zone. The average annual precipitation in the area is about 40 inches (National Oceanic and Atmospheric Administration [NOAA] 1973). Winter snowfall is heavy, and severe rain storms occur in the summer (USGS 1969). The average total precipitation for Silverton, Colorado as totaled from the Western Regional Climate Center database is 24.50 inches. The 2-year, 24-hour rainfall event for this area is 2 inches (NOAA 1973).

3.3 PREVIOUS INVESTIGATIONS

- March 1995 *Reconnaissance Feasibility Investigation Report of the Upper Animas River Basin*. Colorado Division of Minerals and Geology. J. Herron, B. Stover, P. Krabacher, and D. Bucknam.

- October 1995 *Animas Discovery Report – Upper Animas River Basin.* CDPHE – Hazardous Materials and Waste Management Division. Camille Farrell.
- February 1997 *Water Quality and Sources of Metal Loading to the Upper Animas River Basin.* CDPHE – Water Quality Control Division. J. Robert Owen.
- July 1997 *Sampling and Analysis Plan for a Site Inspection of the Upper Animas Watershed, Silverton Mining District, San Juan County, Colorado.* CDPHE – Hazardous Materials and Waste Management Division. Camille Farrell.
- April 1998 *Analytical Results Report, Cement Creek Watershed, San Juan County, Colorado.* CDPHE Hazardous Materials and Waste Management Division. Camille Farrell. Five ground water, 6 surface water, 53 sediment, and 15 source samples collected in 1996. Data validation reports are not available. These data are not usable for a HRS evaluation of the site because sample locations are not documented and data validation cannot be documented.
- September 1998 *Cement Creek Reclamation Feasibility Report, Upper Animas River Basin.* Colorado Division of Minerals and Geology. Jim Herron, Bruce Stover, and Paul Krabacher. Forty waste rock locations and four soil locations in the Cement Creek drainage were sampled by collecting a liquid extract of the rock or soil material from 10 to 20 aliquots at each location. These data are not usable for a HRS evaluation of the site because the analytical results are for extracts from composite samples.
- March 1999 *Site Inspection Analytical Results Report for the Upper Animas Watershed, San Juan County, Colorado.* CDPHE – Hazardous Materials and Waste Management Division. Camille Farrell. Samples of mine waste rock, seeps, surface water, and sediment collected in 1997. Exact locations of samples were not documented. Photographs of sample locations are available. Data validation reports are not available. These data are not usable for an HRS

evaluation of the site because sample locations are not documented and data validation cannot be documented.

- May 2009 *Routine Water Quality Sampling, EPA Region 8 Laboratory.* On a monthly basis from May 2009 until the present, EPA personnel have conducted sampling activities at select locations in the Animas River, Cement Creek, and Cement Creek tributaries. At each location EPA personnel collected field data and samples for cations, anions, acidity, total dissolved solids (TDS), total suspended solids (TSS), and total and dissolved metals. Data has been published into a SCRIBE database and in summary spreadsheets made available to the ARSG.
- October 2009 *Data Gap Analysis Report for Targeted National Priority Listing Viability. Upper Animas Mining District.* URS Operating Services. Evaluation of the Cement Creek drainage using criteria of the Hazard Ranking System.

4.0 DATA QUALITY OBJECTIVES FOR SAMPLING

The EPA Data Quality Objectives (DQO) Process is a seven-step systematic planning approach to develop acceptance or performance criteria for EPA-funded projects. The seven steps of the DQO process are:

- Step 1 The Problem Statement;
- Step 2 Identifying the Decision;
- Step 3 Identifying the Decision Inputs;
- Step 4 Defining the Study Boundaries;
- Step 5 Developing a Decision Rule;
- Step 6 Defining Tolerance Limits on Decision Errors; and
- Step 7 Optimizing the Sample Design.

These DQOs were developed by UOS based on information provided by the TDD and the EPA “Guidance for the Data Quality Objectives Process” (EPA 2000). The Upper Animas Mining District Site Reassessment Project Data Quality Objectives are presented under separate cover in this report in Appendix D.

Based upon the risks associated with the hazardous substances, the project team identified surface water pathway as the primary pathway of concern and soil exposure pathway as the pathways of secondary potential concern at the Upper Animas Mining District site during the September 2010 reconnaissance and the October and November 2010 sampling activities.

5.0 FIELD PROCEDURES

5.1 SAMPLE LOCATIONS

This SR involved the collection of 116 field samples and 6 field QC/QA samples (Figures 3, 4, and 5). These samples included 46 surface water samples, 46 sediment samples, 14 source soil samples, 5 adit water (aqueous source) samples, and 5 adit sediment samples. Additional QA/QC samples included three duplicate surface water samples and three duplicate sediment samples.

5.1.1 Sample Identification

Sample identification followed the following format:

- UA (Matrix ID) (Sample Location)

UA stands for Upper Animas Mining District Site. Matrices were identified as follows:

- SE = sediment
- SW = surface water
- SO = soil (waste pile/ source samples)
- AD = adit discharge

Sample locations were then numbered sequentially. Detailed information about the sample nomenclature is in the approved FSP (UOS 2010).

5.1.2 Surface Water Samples

Forty-two surface water samples plus three surface water duplicate samples were collected. Surface water samples were collected at points on the Animas River, Cement Creek, and Cement Creek tributaries. Figure 4 shows surface water sample locations.

5.1.3 Sediment Samples

Forty-two sediment samples plus three sediment duplicate samples were collected. Sediment samples were co-located with surface water samples, which were collected at points on the Animas River, Cement Creek, and Cement Creek tributaries. Figure 4 shows the co-located surface water sample locations. Sediment sample location UASE010 was duplicated and named UASE060 because START was concerned there was not enough sample volume. Sample volume was determined to be appropriate by the laboratory, so sample UASE060 was not used in the data evaluation.

5.1.4 Source Samples

Soil Source Samples

Fourteen of 25 planned source soil samples were collected. Samples UASO01 and UASO02 were collected in the vicinity of the American Tunnel. Samples UASO03, UASO04, and UASO05 were collected at the Red and Bonita Mine waste piles. Sample UASO06 was collected at the Mogul North Mine waste pile. Samples UASO07 and UASO08 were collected at the Grand Mogul Stope waste piles. Samples UASO09, UASO10, and UASO11 were collected at the Grand Mogul Mine waste piles. Samples UASO12, UASO13, and UASO14 were collected at the Mogul Mine waste piles. Figure 3 shows the source soil sample locations. Samples were not collected from the Gold King 7 Level waste pile due to lack of landowner access.

Aqueous Source Samples

Five aqueous source samples were collected as part of this investigation. Aqueous source samples were collected at adit discharge points at the Grand Mogul Mine, Mogul Mine, Red and Bonita Mine, Gold King 7 Level Mine, and the American Tunnel. Figure 3 shows aqueous source sample locations.

Adit Sediment Source Samples

Five adit sediment source samples were collected as part of this investigation. Adit sediment source samples were collected at adit discharge points at the Grand Mogul

Mine, Mogul Mine, Red and Bonita Mine, Gold King 7 Level Mine, and the American Tunnel. Figure 3 shows adit sediment sample locations.

5.2 SAMPLING METHODS

5.2.1 Surface Water Sampling

Surface water sampling was conducted according to UOS TSOP 4.18, “Surface Water Sampling.” START personnel measured field parameters, including pH, temperature, and electrical conductivity of each sample, as described in TSOP 4.14, “Water Sample Field Measurements” (UOS 2005b). Field instrumentation was calibrated daily and all calibration and field data were recorded in the field logbook. All surface water samples were collected for dissolved metals because dissolved metals better reflect the impact on sensitive environments. All source and surface water samples designated as dissolved metals were filtered in the field by using a peristaltic pump to draw the water directly through a 0.45 micrometer (μm) filter with disposable dedicated Tygon tubing into the sample bottle (Appendix A, photos 22, 25, 39, 45, and 62). Surface water samples designated for total metals analysis were collected directly from the source into the sample bottle. All aqueous metals analysis samples were preserved with nitric acid to a pH <2 and stored on ice immediately after collection. Sampling was conducted from the farthest downstream location to the farthest upstream location to minimize the potential for cross-contamination. All surface water sample locations were photographed and documented in the project logbook during sampling activities (Appendices A and C) (UOS 2010).

During surface water sampling, START personnel had planned to assess wetlands to determine if they meet the 40 CFR 230.3 Definition of a Wetland, but the snow cover on the ground was too extensive to observe wetlands (Appendix A, photos 41-44) (OFR 2005).

5.2.2 Sediment Sampling

Sediment samples from both streams and adits were collected for total metals and PCB analysis. Sediment sampling was conducted according to UOS TSOP 4.17, “Sediment Sampling” (UOS 2005b). Sediment sampling locations correspond to surface water sampling locations (Figures 4 and 5) (Table 1). START personnel collected sediment

samples in conjunction with surface water sampling, and collected the sediment sample after the surface water sample had been collected, proceeding from the most downstream location to the most upstream location. START personnel collected sediment samples using a disposable plastic scoop and a sample jar. Samples for total metals were placed in 8-ounce polypropylene jars, and samples for PCB analysis were placed in 8-ounce amber glass jars. Sediment samples were stored on ice. All sediment sample locations were photographed and documented during sample activities (UOS 2010). At locations UASE012, UASE030, and UASE059 there was not enough sediment to collect samples for PCBs, so only metal samples were collected.

5.2.3 Source Soil Sampling

All 14 of the soil samples collected during the SR were source samples and were collected in accordance with procedures described in UOS TSOP 4.16, “Surface and Shallow Depth Soil Sampling” (UOS 2005b). START personnel dug below snow in several locations on each pile and performed XRF analysis of the driest soil in the hole. In-situ XRF analysis showed waste piles were homogeneous, so START personnel collected one grab sample from each distinct area of a waste area; for example, one sample per pile, or one sample on each side of large piles. START personnel used disposable plastic scoops for source sample collection. All source samples were collected as biased grab samples from the 6- to 12-inch depth interval, where possible. The 6- to 12-inch depth interval was chosen because it is below the oxidized layer, but near the surface where exposure to water flow occurs. In the locations in the vicinity of the American Tunnel (UASO01 and UASO02), the ground was too hard to get to the 6-inch depth, and the samples were dug to a depth immediately below the oxidized layer of source material, approximately 2 inches. A pick axe was used to reach the depth needed for the sample and was decontaminated between samples. Sample descriptions were logged in the field logbook. Global Positioning System (GPS) data were collected for each sample location.

5.2.4 Adit Water Sampling

Adit water sampling was conducted according to UOS TSOP 4.18, “Surface Water Sampling.” START personnel measured field parameters, including pH, temperature, and electrical conductivity of each sample, as described in TSOP 4.14, “Water Sample Field

Measurements” (UOS 2005b). Field instrumentation was calibrated daily, and all calibration and field data were recorded in the field logbook. All adit water samples were collected for total and dissolved TAL metals. Dissolved metal water samples were drawn through a 0.45 μm filter using a peristaltic pump with disposable dedicated Tygon tubing (Appendix A, photos 22, 25, 39, 45, and 62). Total metal samples were collected by immersing the sample bottles directly in the sample media. The water samples were preserved with nitric acid to a pH <2 and stored on ice. All adit water sample locations were photographed and documented in the project logbook during sampling activities.

5.3 ANALYTICAL PARAMETERS

Surface water samples were filtered in the field and delivered for dissolved TAL metals analysis to the EPA Region 8 ESAT Laboratory in Golden, Colorado. Adit water samples were analyzed for both total and dissolved TAL metals by EPA Region 8 ESAT Laboratory in Golden, Colorado. Adit water samples for dissolved metals analysis were also filtered in the field. The standard CLP low concentration water (method SOM01.2) contract quantitation limits are 1 $\mu\text{g/L}$ for lead, 5 $\mu\text{g/L}$ for manganese, 5 $\mu\text{g/L}$ for copper, 1 $\mu\text{g/L}$ for cadmium, and 10 $\mu\text{g/L}$ for zinc (EPA 2010).

The sediment and source soil samples were analyzed through the CLP for TAL total metals and PCBs. The standard CLP (method SOM01.2) contract quantitation limits are 1 milligram per kilogram (mg/kg) for arsenic, 0.5 mg/kg for cadmium, 1 mg/kg for lead, 1.5 mg/kg for manganese, 1 mg/kg for silver, and 6 mg/kg for zinc which are all well below applicable benchmarks for comparison (EPA 2010).

6.0 ANALYTICAL RESULTS

The sample data collected during this SR were reviewed using the HRS guidelines for analytical interpretation (OFR 1990). The analytical data is listed in Tables 2 through 8. Elevated concentrations of contaminants reported as three times or more above background contaminant values are noted in the analytical results tables and are determined by sample concentrations based on the following:

- If the background analyte concentration is greater than its Sample Quantitation Limit (SQL), and if the release sample analyte concentration is greater than its SQL, 3 times greater than the background, and 5 times greater than the blank concentration.

- If the background analyte concentration is not greater than its SQL and if the release sample analyte concentration is greater than its SQL, greater than the background Contract Required Detection Limit (CRDL), and 5 times greater than the blank analyte concentration.

Results which exceed background by three times and are in excess of a benchmark are indicated by a closed star (★). Results which exceed background by three times but are not in excess of a benchmark are indicated by an open star (☆). Sample quantitation limits are included in Appendix B.

All of the CLP RAS and Region ESAT laboratory data have been validated. The data validation reports are presented in Appendix B. CLP Form I documents are also presented in Appendix B with the validation reports.

Previous investigations in the Upper Animas Mining District identified the tailings piles and adit discharges from the five main waste areas as sources of contamination, but did not yield conclusive information regarding possible migration of contaminants into the Groundwater Pathway, Surface Water Pathway, and the Soil Exposure Pathway. This SR was performed to determine if any contamination from the Upper Animas Mining District site has migrated into the environment where it is impacting potential environmental and/or human health targets. Contaminants are present at the Upper Cement Creek source areas at levels equal to or greater than SCDM Reference Dose Screening Concentrations (RDSC), Cancer Risk Screening Concentrations (CRSC) or MCLs (EPA 2004). Analytical results for surface water were compared to environmental benchmarks. Analytical results for sediment were compared to background sediment results only because no benchmarks have been established for sediment. Analytical results for soil were compared to SCDM RDSC and CRSC values.

Data gathered as part of this SR concludes that the Surface Water Pathway is affected by metals in sources in the Upper Cement Creek mines in the Upper Animas Mining District site.

6.1 SOURCE SOIL/MINE WASTE RESULTS

The source soil samples contained all of the TAL metals in varying amounts. Aluminum concentration ranged from 665 mg/kg at Grand Mogul Mine to 19,500 mg/kg at Mogul Mine. Antimony concentrations ranged from non-detect in the area of the American Tunnel to 13.5 mg/kg at Mogul North Mine. Arsenic concentrations ranged from 9.1 mg/kg at Red and Bonita to 96.8 mg/kg at Grand Mogul. Cadmium concentrations ranged from non-detect at multiple locations to 35.4 mg/kg at Red and Bonita. Copper concentrations ranged from 33.1 mg/kg at Grand Mogul Mine to 4,600 mg/kg at Grand Mogul Mine. Lead concentrations ranged from 241

mg/kg at the American Tunnel to 15,500 mg/kg at Grand Mogul Mine. Magnesium concentrations ranged from non-detect at multiple locations to 12,700 mg/kg at Grand Mogul Mine. Manganese concentrations ranged from 122 mg/kg at Grand Mogul Mine to 5,570 mg/kg at Mogul Mine. Nickel concentrations ranged from non-detect at multiple locations to 9.5 mg/kg at Mogul Mine. Silver concentrations ranged from 1.3 mg/kg at the American Tunnel to 113 mg/kg at Grand Mogul Mine. Zinc concentrations ranged from 102 mg/kg at the American Tunnel to 11,300 mg/kg at Red and Bonita Mine. See Table 4 for source sample results and Figure 3 for soil sample locations and results.

Source soil samples were also submitted for PCB analysis. The only detection for PCBs was in UASO010 collected at Grand Mogul Mine. Arochlor 1248 was detected in UASO010 at a concentration of 12 µg/kg.

6.2 AQUEOUS SOURCE RESULTS

Adit/aqueous source water samples contained varying amounts of TAL total (except for sample UASW059 which was analyzed for dissolved metals only) and dissolved metals. Antimony, arsenic, selenium, silver, thallium, and vanadium were non-detect for all total and dissolved samples. Observed total cadmium concentrations ranged from 1.97 µg/L at the American Tunnel portal to 55 µg/L at the Mogul Mine adit. Total copper concentrations ranged from non-detect at the American Tunnel portal and the Red and Bonita portal to 4,030 µg/L at the Gold King 7 Level adit. Total lead concentrations ranged from 3.7 µg/L at the American Tunnel to 271 µg/L at the Mogul Mine adit. Total manganese concentrations ranged from 28,000 µg/L at the Gold King 7 Level to 44,000 µg/L at the American Tunnel portal. Total zinc concentrations ranged from 15,500 µg/L at Red and Bonita Mine to 31,300 µg/L at Mogul Mine.

Observed dissolved cadmium concentrations ranged from 2.02 µg/L at the American Tunnel portal to 105 µg/L at the Grand Mogul Mine. Dissolved copper concentrations ranged from non-detect at the American Tunnel portal and the Red and Bonita portal to 4,690 µg/L at the Grand Mogul Mine. Dissolved lead concentrations ranged from 1.12 µg/L at the American Tunnel to 255 µg/L at the Mogul Mine adit. Dissolved manganese concentrations ranged from 27,800 µg/L at the Gold King 7 Level to 41,700 µg/L at the American Tunnel portal. Total zinc concentrations ranged from 15,400 µg/L at Red and Bonita Mine to 32,700 µg/L at Mogul Mine. See Table 2 for adit water sample results.

6.3 ADIT SEDIMENT SOURCE RESULTS

Adit/source sediment samples contained varying amounts of total metals. Beryllium and cadmium were non-detect for all samples. Observed antimony concentrations ranged from non-detect at multiple locations to 23.2 mg/kg at the Grand Mogul Mine. Observed arsenic concentrations ranged from 19.1 mg/kg at the American Tunnel portal to 969 mg/kg at the Grand Mogul Mine. Observed chromium concentrations ranged from non-detect at multiple locations to 7.4 mg/kg at the Red and Bonita Mine adit. Copper concentrations ranged from 11 mg/kg at the Gold King 7 Level to 369 mg/kg at the Red and Bonita Mine adit. Lead concentrations ranged from 59.4 mg/kg at the Red and Bonita Mine adit to 1,740 mg/kg at the Gold King 7 Level adit. Manganese concentrations ranged from 107 mg/kg at the Gold King 7 Level to 2,110 at the Mogul Mine adit. Zinc concentrations ranged from 63.3 mg/kg at Red and Bonita to 524 mg/kg at Grand Mogul Mine. See Table 3 for adit/source sediment sample results.

6.4 SELECTION OF SURFACE WATER AND SEDIMENT BACKGROUND VALUES

The Cement Creek Drainage Basin covers a varied geologic terrain that hosts different mineralogical assemblies that were mined at different levels of extraction by different mining methodologies. Mine wastes were accumulated differently at various parts of the basin and sources are composed of various mixes of contaminated mine waste and adit discharges. The selection of just one location as a background was not practical. To determine a representative background, five locations were chosen as backgrounds for this investigation. The highest background value of the five selected locations was taken as the investigation background value for evaluation of the surface water pathway. The analytical results of the five surface water dissolved metals and the resulting background value are presented in Table 5. The analytical results of the five sediment sample TAL total metals results and the resulting background sediment value are presented in Table 7. The five background locations are:

- Sample location UASW003 (A68) located on the Animas River immediately prior to the confluence with Cement Creek, selected because the Animas River is the next drainage east of Cement Creek, originates in the area immediately east of the headwaters of Cement Creek and is the location of moderate mineralization and mining activity;

- Sample location UASW005 (CC17), selected as the most upstream sample location on the South Fork of Cement Creek;
- Sample location UASW012, selected as the most upstream sample location on the North Fork of Cement Creek;
- Sample location UASW030 (CC01F), selected as the most upstream location in the Lower Ross Basin; and
- Sample location USSW045, selected from Minnesota Gulch, a tributary stream from the western side of the Cement Creek Basin that is located in mineralized terrain with minimal mining activity.

6.5 SURFACE WATER RESULTS

The surface water dissolved metals analytical data is presented in Table 6 in a most upstream to most downstream sequence. None of the analytical results that were greater than 3 times background were qualified as J, J-, or J+; therefore, none of the analytical data was required to be adjusted per the EPA's 1996 guidance document "EPA 540-F-94-028—Using Qualified Data to Document an Observed Release and Observed Contamination." The surface water dissolved analytical results reveal that concentrations of seven dissolved metals (aluminum, cadmium, copper, iron, lead, nickel, and zinc) are greater than 3 times the background dissolved surface water value and greater than an SCDM benchmark. The dissolved aqueous concentrations of three additional metals (beryllium, cobalt, and manganese) that do not have an SCDM benchmark also occur at concentrations greater than 3 times background.

Iron and zinc both occur at elevated concentrations (greater than 3 times background and greater than an SCDM benchmark) in 23 of the dissolved surface water samples throughout the Cement Creek stream course. Elevated concentrations of aluminum occur at three locations in the upper half of the Cement Creek drainage. The SCDM ecological toxicity of these three metals is low (aluminum 100 µg/l, iron 10 µg/l, and zinc 10 µg/l) (EPA 2004).

Nickel with an SCDM ecological toxicity of 100 is found in an elevated concentration at one location in Cement Creek (UASW009) just below the confluence with the North Fork of Cement Creek.

Dissolved copper and lead are both detected in elevated concentrations at four locations in the middle section of Cement Creek. The SCDM ecological toxicity of copper and lead is 1,000

(EPA 2004). Cadmium occurs at elevated concentrations at 10 sample locations (Table 6). These locations bracket a series of small wetlands found in the upper half of the Cement Creek drainage. The SCDM ecological toxicity of cadmium is 10,000 (EPA 2004).

Beryllium, cobalt, and manganese are all detected at greater than 3 times background in the dissolved surface water analyses from Cement Creek, but these three elements do not have an associated SCDM benchmark (Table 6) (EPA 2004). Manganese was detected at 14 locations most of which are located in the middle section of Cement Creek (Table 6).

See Table 5 for the background dissolved surface water value determination, Table 6 for the dissolved surface water sample results, and Figure 4 for sample locations.

6.6 SEDIMENT RESULTS

The sediment analytical results are presented in Table 8 in sample numeric order. The analytical results were reviewed and the qualified results (“J, J+, and J-”) were adjusted using EPA’s 1996 guidance document “EPA 540-F-94-028–Using Qualified Data to Document an Observed Release and Observed Contamination.” These adjustments result in a conservative evaluation of the analytical results.

There are no benchmarks for sediments which prevent any Level I designations of the analytical results.

Iron was found at concentrations greater than 3 times background in the sediment at six locations (UASE007, UASE011, UASE014, UASE046, UASE058). Silver was found at concentrations greater than 3 times background in the sediment at one location (UASE006).

Sediment samples were also submitted for PBC analysis. No PCBs were detected in sediment samples above method detection limits.

See Table 7 for the background sediment value determination, Table 8 for the sediment sample results, and Figure 4 for the co-located surface water sample locations. Adit sediment samples are discussed separately under Section 6.3.

7.0 SOURCES AND WASTE CHARACTERIZATION

This investigation identifies five significant sources in the Upper Cement Creek drainage from which contamination has migrated to the environment. These sources are:

- Grand Mogul Mine – three waste rock piles and one aqueous mine discharge;
- Mogul Mine – one waste rock pile and one aqueous discharge;
- Red and Bonita Mine - one waste rock pile and one aqueous discharge;
- Gold King 7 Level Mine – waste rock piles and an aqueous discharge; and
- American Tunnel – aqueous discharge.

Source sample locations are displayed in Figure 3. All source sample results are also displayed in Tables 2, 3, and 4. Photographs of the sample locations are presented under separate cover in Appendix A.

The first source area consists of the three waste rock piles and mine discharge at Grand Mogul Mine (Appendix A, photos 58-60 and 63-67). The waste rock piles near the portal of the mine are uncovered and easily accessible via the adjacent county road. The waste rock at Grand Mogul Mine consists of three waste rock piles. The Lower Waste pile is estimated to contain 845 cubic yards, the Stope Complex pile 6,926 cubic yards, and the Eastern Waste pile 18,720 cubic yards (UOS 2011c) for a total of with an estimated total volume of 26,581 cubic yards. Water that is exposed to the waste piles flows into Cement Creek. Metals observed in the waste rock samples (UASO009, UASO010, and UASO011, Table 4) include aluminum, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, thallium, sodium, vanadium, and zinc.

Grand Mogul mine has a collapsed adit, which has had flow rates recorded between 0.004 cfs in September 2009 and 0.157 cfs in June 2009 (Appendix A, photos 46, 63, and 68-70) (EPA 2011). Metals observed in the mine discharge (UASW059, Table 2) include aluminum, arsenic, beryllium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, and zinc.

The second source area consists of a single waste rock pile and an adit discharge from Mogul Mine (Appendix A, photos 46, 63, and 68-70). The waste rock pile is uncovered and easily accessible via the adjacent county road. The waste rock at Mogul Mine consists of one waste rock pile with a volume of 41,374 cubic yards (UOS 2011c). Metals observed in the waste rock samples (UASO012, UASO013, and UASO014, Table 4) include aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium,

cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, silver, thallium, sodium, vanadium, and zinc.

The adit discharge from Mogul Mine passes through a wetland area, where it enters Cement Creek (Appendix A, photo 46). Mogul Mine has a flumed adit, which has had flow rates recorded between 0.095 cfs in July 2010 and 0.178 cfs in July 2009 (EPA 2011). Metals observed in the mine discharge (UAAD004, Table 2) include aluminum, arsenic, beryllium, cadmium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, sodium, and zinc.

The third source area consists of two waste rock piles and an adit discharge from the Red and Bonita Mine (Appendix A, photos 35 and 48-51). The waste rock piles are uncovered and easily accessible via the adjacent county road. The waste rock at Red and Bonita Mine consists of two waste rock piles; Tier 1 pile at 3,160 cubic yards and Tier 2 pile at 802 cubic yards for a total volume of 3,962 cubic yards (UOS 2011b). The adit discharge from the Red and Bonita Mine flows over waste rock piles, where it is channeled through an iron bog and into Cement Creek (Appendix A, photo 35). Metals observed in the waste rock samples (UASO003, UASO004, and UASO005, Table 4) include aluminum, antimony, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, silver, thallium, vanadium, and zinc. Red and Bonita Mine has a collapsed adit, which has had flow rates recorded between 0.403 cfs in April 2010 and 0.749 cfs in May 2009 (EPA 2011) (Appendix A, photo 35). Metals observed in the mine waste (UAAD003, Table 4) include aluminum, arsenic, beryllium, cadmium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, sodium, and zinc.

The fourth source area consists of the waste rock piles and adit discharge from the Gold King 7 Level Mine (Appendix A, photos 38 and 74). The waste rock piles are uncovered and easily accessible via the adjacent county road. The waste rock piles were not sampled as a part of this investigation because the EPA obtained landowner access to sample only the aqueous adit discharge. The adit discharge from the Gold King 7 Level Mine is channeled through a culvert system and flows into the North Fork of Cement Creek. The North Fork of Cement Creek joins with the main stem of Cement Creek downstream of the Red and Bonita Mine. The Gold King 7 Level mine has a flumed adit, which has had flow rates recorded between 0.333 cfs in April 2010 and 0.558 cfs in June 2010 (EPA 2011). Metals observed in the mine discharge (UAAD002, Table 2) collected at the point where water exits the mine tunnel, include aluminum, arsenic, beryllium, cadmium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, sodium, and zinc.

The fifth source area consists of waste rock and discharge from the American Tunnel (Appendix A, photos 27, 28, and 47). The American Tunnel discharge consists of a portal which flows through a channel (including a flume) into Cement Creek. Flows at the American Tunnel have been observed between 0.178 cfs in February 2010 and 0.318 cfs in May 2009. There was also waste rock in the vicinity of the American Tunnel Portal. The original volume of waste rock is not known, because an unknown portion of this area was reclaimed.

Between October 25 and November 2, 2010, START collected samples from each of the potential sources and sent them to a CLP laboratory or the Region 8 ESAT laboratory for metals analysis. The source soil samples and source aqueous samples contained all of the TAL metals in varying amounts. Metals found in the sources that potentially may affect targets along the surface water pathway include cadmium, lead, manganese, and zinc. See the analytical results in Section 6.0 of this report for information regarding each metal.

8.0 GROUNDWATER PATHWAY AND TARGETS

A review of the groundwater well records for wells in the Cement Creek drainage maintained by the State of Colorado Division of Water Resources identified seven domestic or household use wells (Division of Water Resources 2009). It is not currently documented if the wells in the Cement Creek drainage are used for obtaining drinking water.

The Town of Silverton does not utilize groundwater as a source of municipal water (Town of Silverton 2009).

The groundwater pathway was not included as part of this investigation.

9.0 SURFACE WATER PATHWAY AND TARGETS

The surface water pathway is the pathway most impacted by mining and milling activities in the Cement Creek drainage. Millions of tons of mine and mill waste were dumped directly into the area streams as a normal operating practice between 1890 and 1935 and to a far lesser extent until 1991 (USGS 2007c). The fine-grained material has had ample opportunity to spread unimpeded downstream and contaminate stream sediment as far as the Animas River.

The sources of impact to surface water in the Cement Creek drainage are adit discharges and water flow over waste piles. The main inflows contributing to surface water contamination are located at the Grand

Mogul Mine, Mogul Mine, Red and Bonita Mine, American Tunnel, and Gold King 7 Level Mine. The probable point of entry (PPE) at each of these locations is the point where surface water flow enters Cement Creek either in the form of an adit discharge or surface water flow over mine waste. The PPE that extends furthest downstream in the Animas River from the Upper Animas Mining District site is the PPE from the American Tunnel (Figure 1).

There is no documentation of surface water intakes for drinking water, agricultural, or industrial use along Cement Creek or the Animas River within the aggregate 15-mile downstream limit. The first use of surface water below the confluence of Cement Creek with the Animas River is the Tall Timber Ditch Alternative Point which is located 17 miles downstream of Silverton, Colorado. The ditch has historically been used for irrigation and is owned by Beggrow Enterprises of Durango, Colorado (Colorado Division of Water Resources 2009). The Animas River is used for occasional sport recreational use (e.g., rafting) within the 15-mile downstream limit, but the relative inaccessibility of the river along much of the stream course mitigates against active recreational use along the entire stretch (Mild to Wild Rafting 2009).

Town of Silverton does not have a municipal intake on Cement Creek or the Animas River, but obtains its drinking water supply from Bear and Boulder Creeks. Bear Creek is located in unmineralized terrain of the Mineral Creek drainage west-southwest of Silverton between Bear and Sultan Mountains outside the area of influence of Cement Creek. Boulder Creek flows into the Animas River northeast of Silverton after it passes around the Mayflower Tailings Ponds via a diversion (USGS 1955, Town of Silverton 2009).

Cement Creek is not a fishery; however, the Animas River below Silverton is stocked and fished (Colorado Division of Wildlife [CDOW] 2009). Rainbow, brook, and native trout are caught in the Animas River below Silverton, and anecdotal accounts report that the fish are consumed by humans (Outdoor World 2009). Elk Park, located approximately 5 miles downstream of Silverton on the Animas River and accessible only on foot, was specifically identified as a location where fishermen catch and consume fish (Figure 1) (Outdoor World 2009). Elk Park is also the site of a CDOW electro-fishing study with data from 2005 and 2010 where a reduction in fish population was noted between 2005 and 2010 (CDOW 2011).

Approximately 2,500 feet of streamside wetlands are estimated to be found along Cement Creek (U.S. Department of the Interior, Fish and Wildlife Service [USDOI] 1998a, c). Iron bogs are found along the middle stretch of Cement Creek. Approximately 3 miles of palustrine and riverine streamside wetlands

are estimated to be found along the 15-mile downstream segment of Cement Creek and the Animas River below the PPE of the American Tunnel at Cement Creek (USDOI 1998b, d).

A rare form of sphagnum moss (*Sphagnum obtusum*) has been identified at the confluence of the North Fork of Cement Creek with Cement Creek (Michigan Tech University 2011). Other sensitive environments and other threatened and endangered species present in the area include the Canada Lynx (threatened) and the Southwest Willow Flycatcher (endangered), and the Uncompahgre fritillary butterfly (endangered) (U.S. Department of the Interior, Fish and Wildlife Service (USDOI). 2011).

START collected surface water samples from Cement Creek, adit discharges, and the Animas River in late October and early November of 2010. Four background samples were collected from locations on Cement Creek, and one background sample was collected on the Animas River upstream of the confluence with Cement Creek. Surface water samples indicated that concentrations of aluminum, beryllium, cadmium, copper, iron, lead, manganese, nickel, and zinc were found at levels at least 3 times the background level. Cadmium is the most widespread contaminant and is found in several samples that include an estimated 2,500 feet of streamside wetlands. See the surface water analytical results in Section 6.0, as well as Table 6 and Figure 4 in this report, for the concentrations of each metal. Sediment samples indicated that concentrations of antimony, arsenic, iron, and silver were present in a limited number of samples. The highest concentration of sediment contamination was in Cement Creek at the toe of the Grand Mogul Mine (UASE09) (Table 8).

10.0 SOIL EXPOSURE PATHWAY AND TARGETS

The Cement Creek area within the Upper Animas Mining District has several sources of mine waste. In October and November 2010, START collected soil samples from waste rock piles in the Upper Animas Mining District Site. The sources examined as a part of this investigation included soil from the vicinity of the American Tunnel, the Red and Bonita Mine, Mogul Mine, Grand Mogul Mine, Mogul North Mine, and the Grand Mogul Stope. A soil sample could not be collected from the Gold King 7 Level Mine due to sampling limits in the access agreement with the property owner.

The mine sites have very little vegetation and no containment, and mine tailings and waste rock remain exposed to the elements. Access to the mine sites is not restricted in any way. The adjacent roads are used for recreation by ATVs and driven on by hunters and tourists in the area. There are no residents or workers on the mine sites, and it is unknown if any people reside in the vicinity of the mine sites.

The lynx, which has been observed in the area, is a federally listed threatened and state-listed endangered species, and the Boreal toad is a state-listed endangered species (CDOW 2010). The Boreal toad could live in wetlands adjacent to the Cement Creek (CDOW 2010).

11.0 AIR PATHWAY AND TARGETS

The air pathway was not evaluated as a part of this site reassessment because of the reportedly very low population density in the Cement Creek drainage and the fact that the ground surface is snow-covered for at least 6 months out of the year.

12.0 DATA QUALITY ANALYSIS

12.1 DATA QUALITY OBJECTIVES

The EPA DQO Process is a seven-step systematic planning approach to develop acceptance or performance criteria for EPA-funded projects. Based upon the risks associated with the hazardous substances, the project team identified surface water and soil exposure as the pathways of potential concern at the site. Surface water and sediment samples were used to determine if there was a significant release of contaminants in the Surface Water Pathway. Soil samples were collected to determine the potential for contamination in Cement Creek by flow over mine waste.

This SR was prompted by the many concerns surrounding the Upper Animas Mining District site. The principal goal of this study was to determine if contamination from the Upper Animas Mining District has migrated into the environment where it is impacting potential environmental and/or human health targets in the surface-water pathway.

The primary study questions for this investigation that were answered by the results of this investigation were:

1. Determining if waste piles and draining adits contained elevated concentrations of metals;
2. Determining if surface waters and sediments in Cement Creek and the Animas River were impacted by sources at the former mine sites;
3. Determining if environmental sample concentrations of metals exceed applicable benchmarks; and

4. Determining if elevated concentrations of metals and PCBs identified in the surface water and sediments are attributable to the sources at the former mine sites.

Fifty-four surface water samples and 54 sediment samples plus 3 duplicate surface water and sediment samples were collected in October 2010 from the Animas River, Cement Creek, and their tributaries within the study area to try to attribute contamination in Cement Creek and the Animas River to various sources.

Fourteen source soil samples and four aqueous source samples were collected in October 2010 from the potential sources and the mines in the Upper Animas Mining District.

All analytical data have been reviewed and verified to ensure that data is acceptable for the intended use (Appendix B). The Data Quality Objectives for this project have been met and the data collected is of sufficient quality to answer the study questions.

12.2 DATA VALIDATION AND INTERPRETATION

All data analyzed by the CLP RAS laboratories were validated by a third party subcontracted chemist. All data are acceptable for use as qualified in the data validation report. The data validation report, laboratory forms, and SQL calculations are presented in Appendix B.

There were some qualifications applied to each inorganic data package associated with this sampling event. The ESAT Inductively coupled plasma mass spectroscopy ICMPS data package DG-216 had a “U” qualifier applied to all silver and molybdenum results because silver and molybdenum were detected in the prep blanks. A “J+” qualifier was added to all beryllium results because the calibration showed slightly high results for beryllium.

The CLP Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES) data package MH35H7 for the sediment samples had a qualifier “U” applied to antimony for 11 samples because antimony was detected in the blank. A “U” qualifier was applied to beryllium results for 14 samples because beryllium was detected in the blank. A “U” qualifier was applied to cadmium results for six samples because cadmium was detected in the blank. A “U” qualifier was applied to chromium results for three samples because chromium was detected in the blank. A “U” qualifier was applied to cobalt results for six samples because cobalt was detected in the blank. A “U” qualifier was applied to magnesium results for eight samples because magnesium was detected in the blank. A “U” qualifier was applied to nickel results for six samples because nickel

was detected in the blank. A "U" qualifier was applied to selenium results for 18 samples because selenium was detected in the blank. A "U" qualifier was applied to silver results for one sample because silver was detected in the blank. A "J+" qualifier was applied to beryllium results for five samples because of interference check exceedance and positive interference. The "J-" qualifier was applied to thallium for negative interference on 10 samples. All samples had a "J" or "UJ" applied for copper and lead because the original and duplicate were both greater than 5 times the CRDL, and the Relative Percent Difference (RPD) was greater than 20 percent. All samples had a "J" or "UJ" applied for antimony and silver because the spike recoveries were outside control limits. All samples had a "J+" applied for barium and copper because no post-digest spike was performed. All samples had a "J+" applied for arsenic because spike recoveries were outside control limits. All samples had a "J" or "UJ" applied for arsenic, beryllium, cadmium, copper, nickel, and zinc because the dilutions were greater than 10 percent, and the result was at least 50 times the MDL.

The CLP ICP-AES data package MH35L0 for the sediment samples had a qualifier "U" applied to antimony for nine samples because antimony was detected in the blank. A "U" qualifier was applied to beryllium results for eight samples because beryllium was detected in the blank. A "U" qualifier was applied to cadmium results for four samples because cadmium was detected in the blank. A "U" qualifier was applied to chromium results for two samples because chromium was detected in the blank. A "U" qualifier was applied to cobalt results for two samples because cobalt was detected in the blank. A "U" qualifier was applied to nickel results for one sample because nickel was detected in the blank. A "U" qualifier was applied to selenium results for 10 samples because selenium was detected in the blank. A "U" qualifier was applied to silver results for two samples because silver was detected in the blank. A "J+" qualifier was applied to beryllium results for two samples because of interference check exceedance and positive interference. Thallium was qualified "J+" for interference check exceedance and positive interference in all samples. A "J+" qualifier was applied to silver results for eight samples because of interference check exceedance and positive interference. All samples had a "J-" or "UJ" applied for selenium and thallium because the post-digestion spike recoveries were outside control limits. All samples had a "J" or "UJ" applied for antimony and silver because the post-digestion spike recoveries were outside control limits. All samples had a "J+" applied for arsenic because spike recoveries were outside control limits. All samples had a "J" applied for arsenic, lead, and zinc because the dilutions were greater than 10 percent.

The CLP ICP-AES data package MH35E5 for the sediment samples had a qualifier “U” applied to antimony for all samples because antimony was detected in the blank. A “U” qualifier was applied to beryllium results for 15 samples because beryllium was detected in the blank. A “U” qualifier was applied to cadmium results for ten samples because cadmium was detected in the blank. A “U” qualifier was applied to chromium results for one sample because chromium was detected in the blank. A “U” qualifier was applied to magnesium results for one sample because magnesium was detected in the blank. A “U” qualifier was applied to silver results for two samples because silver was detected in the blank. A “U” qualifier was applied to thallium results for 16 samples because thallium was detected in the blank. A “J+” qualifier was applied to beryllium results for five samples because of interference check exceedance and positive interference. A “J+” qualifier was applied to silver results for 18 samples because of interference check exceedance and positive interference. A “J+” qualifier was applied to thallium results for four samples because of interference check exceedance and positive interference. All samples had a “J” or “UJ” applied for barium and zinc because the original and duplicate were both 5 times the CRDL, and the RPD was greater than 20 percent. All samples had a “J” or “UJ” applied for cadmium because the original and duplicate were both 5 times the CRDL, the absolute difference was greater than the CRQL, and post-digestion spike recoveries were outside control limits. All samples had a “J” qualifier applied for copper because the post-digestion spike recoveries were outside control limits. All samples had a “J” qualifier applied for arsenic, beryllium, cadmium, cobalt, copper, and zinc because the dilutions were greater than 10 percent.

The CLP ICP-AES data package MH35G5 for the sediment samples had a qualifier “U” applied to antimony for 18 samples because antimony was detected in the blank. A “U” qualifier was applied to beryllium results for 18 samples because beryllium was detected in the blank. A “U” qualifier was applied to cadmium results for 15 samples because cadmium was detected in the blank. A “U” qualifier was applied to chromium results for one sample because chromium was detected in the blank. A “U” qualifier was applied to cobalt results for five samples because cobalt was detected in the blank. A “U” qualifier was applied to magnesium results for nine samples because magnesium was detected in the blank. A “U” qualifier was applied to nickel results for four samples because nickel was detected in the blank. A “U” qualifier was applied to selenium results for 20 samples because selenium was detected in the blank. A “U” qualifier was applied to silver results for seven samples because silver was detected in the blank. A “U” qualifier was applied to thallium results for 17 samples because thallium was detected in the blank. A “J+” qualifier was applied to beryllium results for two samples because of interference

check exceedance and positive interference. A “UJ” qualifier was applied to thallium for all samples due to a potentially false negative detection in the interference check. All samples had a “J-” or “UJ” qualifier applied for selenium and zinc because the post-digestion spike recoveries were outside control limits. All samples had a “J” or “UJ” qualifier applied for antimony and silver because the post-digestion spike recoveries were outside control limits. All samples had a “J” qualifier applied for arsenic, beryllium, cadmium, chromium, copper, manganese, nickel, and zinc because the dilutions were greater than 10 percent.

13.0 MEASUREMENT QUALITY OBJECTIVES

13.1 FIELD QUALITY CONTROL PROCEDURES

All samples were handled and preserved as described in UOS TSOP 4.2, “Sample Containers, Preservation, and Maximum Holding Times.” Calibration of the pH, temperature, and conductivity meters followed instrument manufacturers’ instruction manuals and UOS TSOP 4.14, “Water Sample Field Measurements.” Sample collection progressed from downstream to upstream to prevent cross-contamination (UOS 2005b).

The following samples were collected to evaluate quality assurance at the site in accordance with the “Guidance for Performing Site Inspections under CERCLA,” Interim Final September 1992, the “Region 8 Supplement to Guidance for Performing Site Inspections under CERCLA,” and the UOS Generic QAPP (EPA 1992, 1993; UOS 2005a):

- Three double volume sediment samples and three double volume surface water samples were used for a MS/MSD. (The double volume samples were not labeled as separate samples.) The percent recoveries and relative differences were within QC limits except for analytes noted in Section 12.2.
- Three field surface water duplicates were collected; the duplicate sample was blind to the lab. The percent difference for the water samples was 4.3 percent.
- Three field sediment duplicates were collected; the duplicate sample was blind to the lab. The percent difference for the water samples was 22.5 percent.

The UOS Generic QAPP serves as the primary guide for the integration of QA/QC procedures for the START contract (UOS 2005a).

13.2 DATA QUALITY INDICATORS

Quality attributes are qualitative and quantitative characteristics of the collected data. The principle quality attributes to environmental studies are precision, bias, representativeness, comparability, completeness, and sensitivity. Data quality indicators (DQIs) are specific indicators of quality attributes. The following DQIs were considered during the review of field collection techniques and field QA/QC results, as well as laboratory QA/QC.

13.2.1 Bias

Bias is systematic or persistent distortion of a measurement process that causes errors in one direction. The extent of bias can be determined by an evaluation of laboratory initial calibration/continuing calibration verification, laboratory control spike/laboratory control, interference checks, spike duplicates, blank spike, MS/MSD, method blank, and trip blank.

A review of the ESAT forms for water samples analyzed for metals detected a high bias in the data set DG-216 for beryllium. There was a positive interference for these metals in the interference check samples. These results were qualified as “J+.”

A review of the CLP forms for soil/sediment samples analyzed for metals detected a high bias in the data sets MH35G5, MH35E5, MH35H7, and MH35L0 for beryllium. Silver and thallium results were biased high in data packages MH35E5 and MH35L0. There was a positive interference for these metals in the interference check samples. These results were qualified as “J+.”

Thallium results were biased low in data packages MH35H7 and MH35G5 because there was a negative interference for these metals in the interference check samples, and the results were qualified “J-/UJ.”

13.2.2 Sensitivity

Sensitivity generally refers to the capability of a method or instrument to discriminate between small differences in analyte concentration and is generally discussed as detection limits. Before sampling begins, it is important to compare detection limits and project

requirements in order to select a method with the necessary detection limits to meet the project goals. The detection limits are described in the analytical methods.

All detection limits met the CLP requirements; therefore, all sensitivity requirements for the project were met.

13.2.3 Precision

Precision is the measure of agreement among repeated measurements of the same property under identical, or substantially similar, conditions and is expressed as the relative percent difference (RPD) between the sample pairs. The field duplicate and MS/MSD were used to evaluate precision.

The average RPD was 4.3 percent for the surface water samples and 22.5 percent for sediment samples. RPD results are presented in Table 9.

13.2.4 Representativeness

Representativeness is the measure of the degree to which data accurately and precisely represents a characteristic of a population parameter, variations at a sampling point, a process condition, or an environmental condition. Representativeness was achieved by adherence to TSOPs for sampling procedures, field and laboratory QA/QC procedures, appropriateness of sample material collected, analytical method and sample preparation, and achievement of acceptance criteria documented in the FSP for the project. Some deviations from the FSP were documented in the field logbook.

The following deviations from the final FSP, dated October 21, 2010, were made in the field based on assessments made by the UOS project manager:

- Samples UASW038 and UASE038 (Illinois Gulch) were not collected because the confluence of Illinois Gulch and Cement Creek was located on private property for which START did not have an access agreement.
- Samples UASW048 and UASE048 (Elk Tunnel discharge) were not collected because START personnel could not identify any flow from Elk Tunnel.

- Samples UASW051 and UASE051 (Mammoth Tunnel discharge) were not collected because START personnel could not identify any flow from Mammoth Tunnel.
- Samples UASW053 and UASE053 (Cement Creek downstream of Prospect Gulch) were not collected because they were located on private property for which START did not have an access agreement.
- Samples UASW055 and UASE055 (Cement Creek upstream of Prospect Gulch) were not collected because they were located on private property for which START did not have an access agreement.
- Samples UASW057 and UASE057 (Dry Gulch discharge) were not collected because START personnel could not identify any flow from Dry Gulch.
- The planned location for samples UASW011 and UASE011 was below all of the Gold King 7 Level waste piles. These samples were instead collected where runoff from the upper piles crosses the mine access road. The planned location could not be safely accessed at the toe of the lower piles due to an extremely steep slope, loose material, and snow.
- In addition to adit water, sediment samples were collected from adit discharge points, as START determined it would provide additional information.
- Fewer soil samples than planned were collected. START personnel dug below snow in several locations on each pile and performed XRF analysis of the driest soil in the hole. In-situ XRF analysis showed waste piles were more homogeneous than expected, so the number of samples required for characterization was reduced.
- Soil samples collected in the vicinity of the American Tunnel, UASO001 and UASO002, were obtained from 0 to 1 inch below ground surface because the ground was frozen and the planned depth of 6 inches could not be obtained.
- Soil samples were not collected at the Gold King 7 Level Mine because the waste piles for which START had an access agreement could not be accessed due to unsafe conditions, including extremely steep slope, loose waste rock material, and snow.
- A sediment sample for PCB analysis was not collected at UASE059 (at the toe of Grand Mogul Mine) because there was not enough sediment available for

both metals and PCB analysis. Metals analysis was deemed more critical to project goals.

- A sediment sample for PCB analysis was not collected at UASE012 (above Gold King 7 Level Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
- A sediment sample for PCB analysis was not collected at UASE030 (Cement Creek upstream of Grand Mogul Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
- Sample AD005 was not collected because there is no adit discharge from Grand Mogul Mine.
- Surface water and sediment samples were not collected at locations 025, 026, 027, 028, and 031 because START was not able to reach the highest elevations due to snowy and potentially unsafe conditions.
- Soil samples were not collected from the Queen Anne Mine, the Adelphin Mine, and the Columbia Mine because START was not able to reach the highest elevations due to snowy and potentially unsafe conditions.
- Documentation of overland flow to Cement Creek was not possible due to extensive snow cover.
- Documentation of wetlands and other sensitive environments was not possible due to extensive snow cover.

13.2.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system. The percent completeness for this project was 81 percent. Samples were collected in accordance with the FSP, except where snowy and/or hazardous conditions or access restrictions prevented collection of planned samples.

13.2.6 Comparability

Comparability is the qualitative term that expresses the confidence that two data sets can contribute to common interpretation and analysis and is used to describe how well samples within a data set, as well as two independent data sets, are interchangeable.

Validated lab data were obtained to ensure comparability to previous sampling events. All samples were sent to a CLP laboratory or the Region 8 ESAT laboratory, and all data were validated (Appendix B).

All samples were collected using the same FSP, TSOPs, and sampling equipment; therefore, all sample data are comparable.

14.0 DATA GAPS

Because of the snow cover in the Cement Creek drainage during the late October and early November 2010 sampling event, several key data elements were not collected. These data gaps include:

- Waste rock/Source samples from the waste rock piles at the Gold King 7 Level Mine and the higher Queen Anne, Adelphin, and Columbia mines;
- Estimates of volume of waste rock material at all the source locations.
- Delineation of wetlands along Cement Creek and determination of wetland qualification for HRS scoring;
- Documentation of the presence of sensitive environment and or threatened and endangered species in the Cement Creek drainage and the Animas River below Silverton, Colorado
- Documentation of recreational fishing and human fish consumption along the 15-mile downstream limit.
- Ultimate disposition of remediated materials at the various mines that have been remediated in the past;
- Evaluation of containment factor values of identified sources for surface water pathway migration as found in Table 4.2 of HRS Rule; and
- Groundwater users in the Cement Creek drainage.

15.0 SUMMARY

The Upper Animas Mining District has a 100-year history of mining and milling in the mountains surrounding Silverton, Colorado. Eight major sources have been identified in the Cement Creek drainage: the Grand Mogul Mine (three waste rock piles and one aqueous discharge); the Mogul Mine (one waste pile and one aqueous discharge); the Red and Bonita Mine (one waste pile and one aqueous discharge); Gold King 7 Level Mine; American Tunnel (aqueous discharge); and the three potential uppermost

sources the Queen Anne, Adelphin, and Columbia mines as well as the waste pile from the Gold King 7 Level Mine which were not sampled as a part of this investigation. The sampled sources contained concentrations of aluminum, antimony, arsenic, beryllium, cadmium, copper, iron, lead, manganese, nickel, silver, and zinc. The quantity of source materials for evaluation of these sources in this investigation was derived from documents of previous investigations.

An appropriate background value for surface water and sediment from this large and geologically varied drainage basin was determined by selecting five background locations and using the highest background value from the five selected locations for each analyte as the investigation background. An observed release of aluminum, cadmium, copper, iron, manganese, lead, and zinc to the surface water pathway is documented from the surface water and sediment results of samples collected from Cement Creek in the autumn of 2010. Cadmium, copper, lead, and zinc concentrations are significant in evaluation of this site. The concentrations of cadmium, copper, lead, and zinc in several surface water samples were 3 times the background surface water value and exceed the applicable SCDM benchmark. The manganese concentrations in surface water samples were 3 times background but do not have an applicable SCDM benchmark.

There are limited occurrences of metals in the sediment greater than 3 times background; however there are no applicable SCDM benchmarks for metals in sediments, which limit the impact of sediment contamination in the evaluation of this site.

Mine waste rock and sediments were analyzed for PCBs. PCBs were not detected in the Cement Creek stream sediments and only one isolated low-level detection was recorded in the mine waste rock at the Grand Mogul Mine.

Environmental and human health targets have been identified within the reach of Cement Creek that is documented to have releases from the identified sources. These targets include an estimated 2,500 streamside feet of small wetlands and potential sensitive environments for plants and animals. While Cement Creek itself is not a fishery, there is evidence that the Animas River below the confluence with Cement Creek is an active fishery where fish are caught and probably consumed by sports fishermen. There is no documentation that surface water from Cement Creek and the Animas River within the 15-mile downstream limit is used as a source of drinking water.

15.0 LIST OF REFERENCES

Animas River Stakeholders Group (ARSG). 2007. Animas River Use and Attainability Analysis Report.

Animas River Stakeholders Group (ARSG). 2009. Conversations with Bill Simon, ARSG Coordinator.

Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division (HMWMD) 1998. Site Inspection Analytical Results Report, Cement Creek Watershed, San Juan County, Colorado.

Colorado Division of Water Resources, Division 7. 2009. Email communication from Jeff Titus, Lead Water Commissioner to Barry Hayhurst, START. July 24, 2009.

Colorado Division of Wildlife (CDOW). 2009. Telephone interview by Barry Hayhurst, START with Andy Holland, Terrestrial Biologist. July 21, 2009.

Colorado Division of Wildlife (CDOW). 2010. Threatened and Endangered List. Revised 07/07/2010. <http://wildlife.state.co.us/WildlifeSpecies/SpeciesOfConcern/ThreatenedEndangeredList/>

Colorado Division of Wildlife (CDOW). 2011. Email communication from Jim White (CDOW) to Sabrina Forrest (US EPA). April 19, 2011.

Division of Water Resources. 2009. State of Colorado Department of Natural Resources, Division of Water Resources Well Permit Records.

Michigan Tech University. 2011. Email mail communication from Rodney Chimner to Sabrina Forrest about Rare Plants in Cement Creek Fens. April 05, 2011.

Mild to Wild Rafting. 2009. Telephone conversation between Alex Michael, President of Mild to Wild Rafting and Barry Hayhurst, START. October 8, 2009.

National Oceanic and Atmospheric Administration (NOAA). 1973. NOAA Atlas 2 – Precipitation-Frequency Atlas of the Western United States, Volume III-Colorado2

Office of the Federal Register (OFR). 1990. Code of Federal Regulation (CFR) 40, Part 300, "Hazard Ranking System (HRS) for Uncontrolled Hazardous Substances Releases." Appendix A of the National Oil and Hazardous Substance Release Contingency Plan; Final Rule, December 14, 1990.

Office of the Federal Register (OFR). 2005. Code of Federal Regulation (CFR) 40, Part 230.3, "Definitions." Definition of a wetland. Final Rule, December 2005.

Outdoor World. 2009. Telephone conversation between Outdoor World employee/fishing guide and Barry Hayhurst, START. October 8, 2009.

Silverton Magazine. June 30, 2009. "The Heart of Historic Silverton." Beverly Rich and Kathryn Retzler.

The Silverton Railroads. 2009. "Gladstone" by Mark L. Evans. Website:
http://www.narrowgauge.org/normap/excur2_gladstone.html.

Town of Silverton, Colorado. 2009. Larry Raab, Public Works Foreman, Town of Silverton. April 28, 2009.

U.S. Department of the Interior, Fish and Wildlife Service (USDOI). 1998a. National Wetlands Inventory Map Quadrangle, Ironton, Colorado.

U.S. Department of the Interior, Fish and Wildlife Service (USDOI). 1998b. National Wetlands Inventory Map Quadrangle, Mountain View Crest, Colorado.

U.S. Department of the Interior, Fish and Wildlife Service (USDOI). 1998c. National Wetlands Inventory Map Quadrangle, Silverton, Colorado.

U.S. Department of the Interior, Fish and Wildlife Service (USDOI). 1998d. National Wetlands Inventory Map Quadrangle, Snowdon Peak, Colorado.

U.S. Department of the Interior, Fish and Wildlife Service (USDOI). 2011. Species Reports-Threatened and Endangered Species in San Juan County, Colorado.

U.S. Environmental Protection Agency (EPA). 1992. "Guidance for Performing Site Inspections Under CERCLA," Interim Final September 1992.

U.S. Environmental Protection Agency (EPA). 1993. "Region 8 Supplement to Guidance for Performing Site Inspections Under CERCLA." January 1993.

U.S. Environmental Protection Agency (EPA). 1996. Using Qualified Data to Document an Observed Release and Observed Contamination. EPA 540-F-94-028. November 1996.

U.S. Environmental Protection Agency (EPA). 1999. Prioritization of Abandoned Mines in the Animas Watershed, Southwestern Colorado. Carol Cox Russell.

<http://www.epa.gov/hardrockmining/scitosci/scifiles/422-animas.pdf>

U.S. Environmental Protection Agency (EPA). 2000. "Guidance for the Data Quality Objectives Process." EPA QA/G-4. Copies may be obtained from the Quality Staff Home Page: www.epa.gov/quality August 2000.

U.S. Environmental Protection Agency (EPA). 2004. Superfund Chemical Data Matrix (SCDM). Updated January 28, 2004. http://www.epa.gov/superfund/sites/npl/hrsres/tools/app_bii.pdf.

U.S. Environmental Protection Agency (EPA). 2010. "National Functional Guidelines for Superfund Inorganic Data Review." January 2010.

U.S. Environmental Protection Agency (EPA). 2011. Upper Animas Mining District Routing Water Quality Sampling Spreadsheets. Updated January 2011.

U.S. Geological Survey (USGS). 1955. Silverton Quadrangle, Colorado – San Juan County.

U.S. Geological Survey (USGS). 1969. "Geology and Ore Deposits of the Eureka and Adjoining Districts, San Juan Mountains, Colorado. Wilbur S. Burbank and Robert G. Luedke. Geological Survey Professional Paper 535.

U.S. Geological Survey (USGS). 2002. "Generalized Geologic Map of Part of the Upper Animas River Watershed and Vicinity, Silverton, Colorado. Douglas B. Yeager and Dana J. Bove. Miscellaneous Field Studies Map MF-2377.

U.S. Geological Survey (USGS). 2007a. *Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed. San Juan County, Colorado*. Professional Paper 1651. Volume 1. Chapter A, "Summary and Conclusions from Investigation of the Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado."

U.S. Geological Survey (USGS). 2007b. *Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed. San Juan County, Colorado*. Professional Paper 1651. Volume 1. Chapter B, "The Animas River Watershed, San Juan County, Colorado." By Paul von Guerard, Stanley E. Church, Douglas B. Yager, and John M. Besser.

U.S. Geological Survey (USGS). 2007c. *Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed. San Juan County, Colorado*. Professional Paper 1651. Volume 1. Chapter C, “History of Mining and Milling Practices and Production in San Juan County, Colorado, 1871-1991.” By William R. Jones.

U.S. Geological Survey (USGS). 2007d. *Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed. San Juan County, Colorado*. Professional Paper 1651. Volume 1. Chapter E3, “Major Styles of Mineralization and Hydrothermal Alteration and Related Solid- and Aqueous-Phase Geochemical Signatures.” By Dana J. Bove, M. Alisa Mast, J. Bradley Dalton, Winfield G. Wright, and Douglas B. Yager.

U.S. Geological Survey (USGS). 2007e. *Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed. San Juan County, Colorado*. Professional Paper 1651. Volume 2. Chapter E16, “Geomorphology of Cement Creek and its Relation to Ferricrete Deposits.” By Kirk R. Vincent, Stanley E. Church, and Laurie Wirt.

U.S. Geological Survey (USGS). 2009. National Water Information System: Web Interface. <http://waterdata.usgs.gov/nwis>. Accessed on...(date).

URS Operating Services, Inc. (UOS). 2005a. “Generic Quality Assurance Project Plan” for the Superfund Technical Assessment and Response Team 2, Region 8. June 13, 2005.

URS Operating Services, Inc. (UOS). 2005b. “Technical Standard Operating Procedures for the Superfund Technical Assessment and Response Team (START), EPA Region 8.”

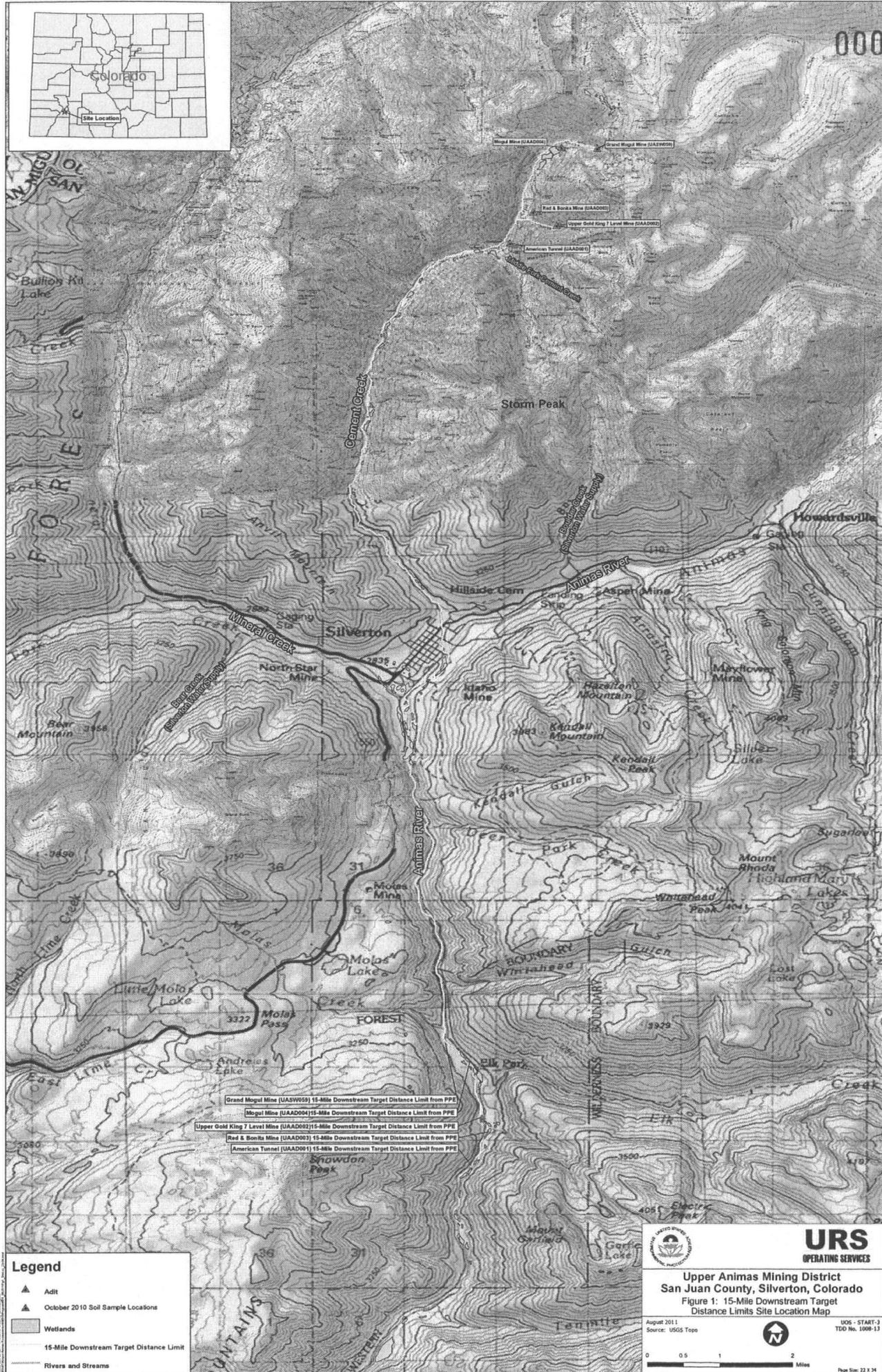
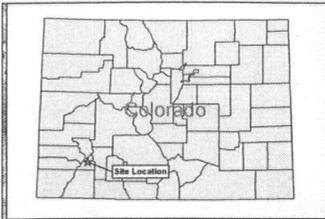
URS Operating Services, Inc. (UOS). 2009. Data Gap Analysis Report for Targeted National Priority Listing Viability. Revision 2. Upper Animas Mining District, San Juan County, Colorado. October 13, 2009.

URS Operating Services, Inc. (UOS). 2010. “Field Sampling Plan: Upper Animas Mining District.” October 21, 2010.

URS Operating Services, Inc. (UOS). 2011a. “Sampling Activities Report: Upper Animas Mining District.” January 11, 2011.

URS Operating Services, Inc. (UOS). 2011b. "Field Activities Report: Summarizing 2010 field activities at the Red and Bonita Mine including GPS survey to delineate extent and estimate volume of waste rock piles." Prepared by J. Gilbert. March 22, 2011

URS Operating Services, Inc. (UOS). 2011c. "Technical Memo: Mogul and Grand Mogul Mine summary of site characterization information including waste piles and pile volume estimates of GPS survey." Prepared by J. Gilbert. January 6, 2011



Grand Mogul Mine (UASW055) 15-Mile Downstream Target Distance Limit from PPE
 Mogul Mine (UAAD004) 15-Mile Downstream Target Distance Limit from PPE
 Upper Gold King 7 Level Mine (UAAD002) 15-Mile Downstream Target Distance Limit from PPE
 Red & Bonita Mine (UAAD003) 15-Mile Downstream Target Distance Limit from PPE
 American Tunnel (UAAD001) 15-Mile Downstream Target Distance Limit from PPE

Legend

- ▲ Adit
- ▲ October 2010 Soil Sample Locations
- ▭ Wetlands
- 15-Mile Downstream Target Distance Limit
- Rivers and Streams

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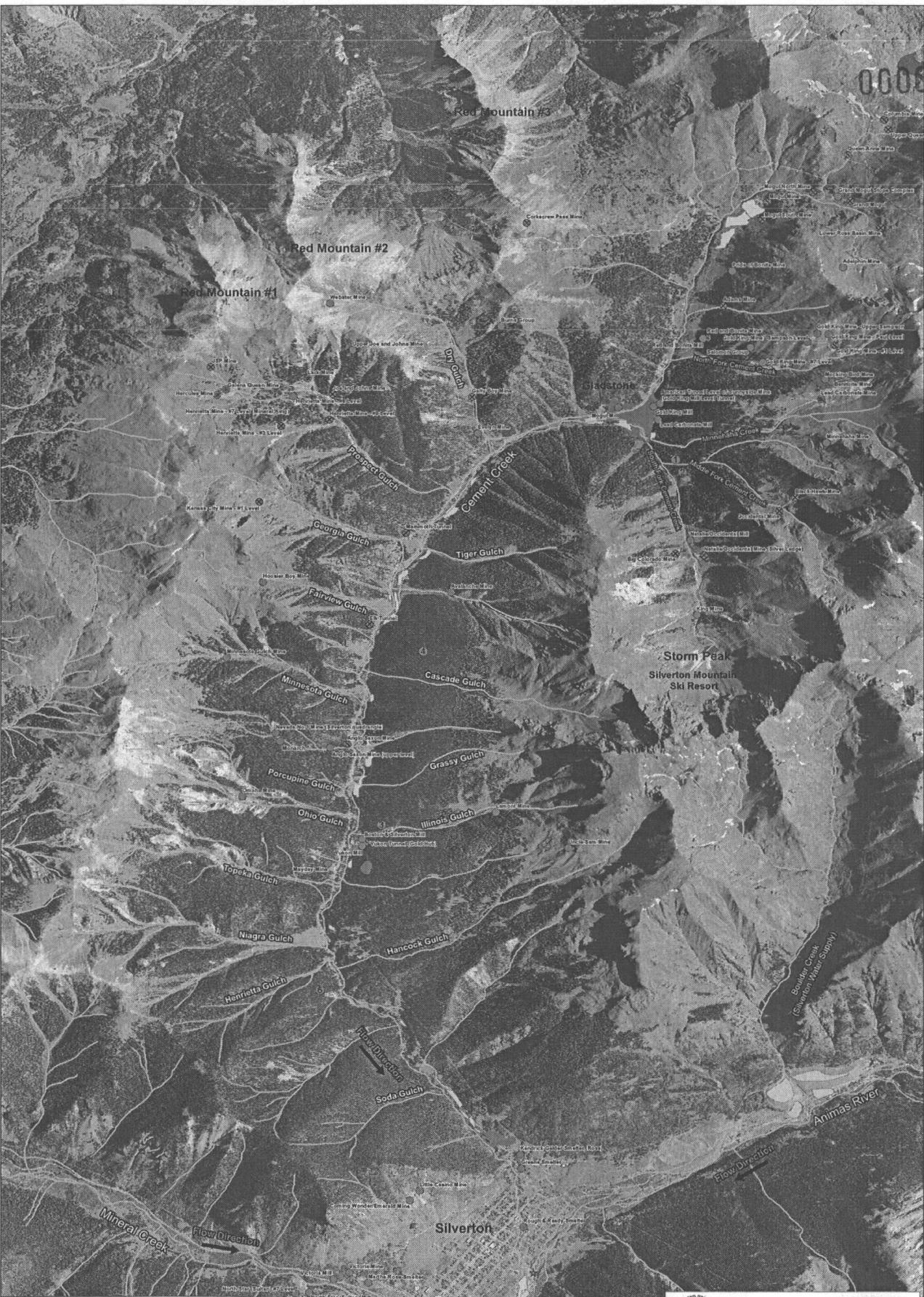
Upper Animas Mining District
San Juan County, Silverton, Colorado
Figure 1: 15-Mile Downstream Target Distance Limits Site Location Map

August 2011
Source: USGS Topo

0 0.5 1 2 Miles

USGS - START-3
TDO No. 1009-13

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Legend

- Mine Site
- Mine with Previous Sampled Mine Waste
- Previously Sampled Mine with some Remediation
- Mine with Mine Waste
- Domestic/Household Wells
- Rivers and Streams
- Wetlands
- Ground Disturbed By Mining Activities
- Tailings Ponds



Upper Animas Mining District
San Juan County, Silverton, Colorado

August 2011
Source: NAIP 2009

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Figure 2: Silverton Area Details Map



0 1,000 2,000 4,000
Feet

UOS - START-3
TDD No. 1008-13

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Mogul Mine

Mogul North

Grand Mogul Mine

Red & Bonita Mine

Upper Gold King 7 Level Mine

American Tunnel

Cement Creek

Middle Fork Cement Creek

Legend

-  October 2010 Soil Sample Locations
-  Wetlands
-  Stream / River
- Source Sample Locations**
-  Adit Discharge
-  Adit Sediment
-  Mine Waste

Note: All results in milligram per kilogram



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Upper Animas Mining District
San Juan County, Silverton, Colorado
Figure 3: Source Sample Locations

August 2011
Source: NAIP 2009

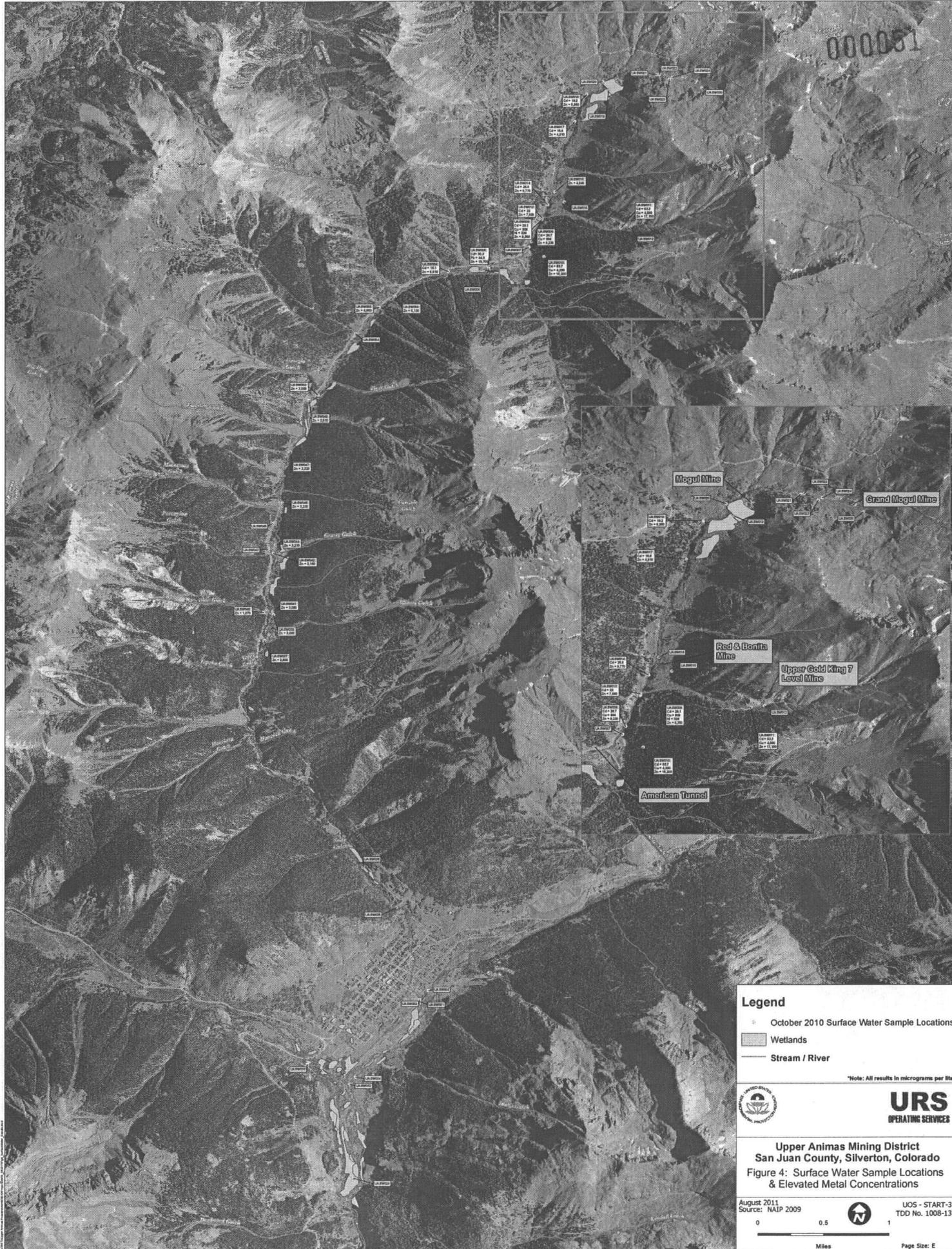
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Feet



UOS - START-3
TDD No. 1008-13

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- Legend**
- ⊛ October 2010 Surface Water Sample Locations
 - ▨ Wetlands
 - Stream / River

*Note: All results in micrograms per liter



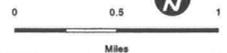
URS
OPERATING SERVICES

Upper Animas Mining District
San Juan County, Silverton, Colorado
Figure 4: Surface Water Sample Locations
& Elevated Metal Concentrations

August 2011
Source: NAIP 2009

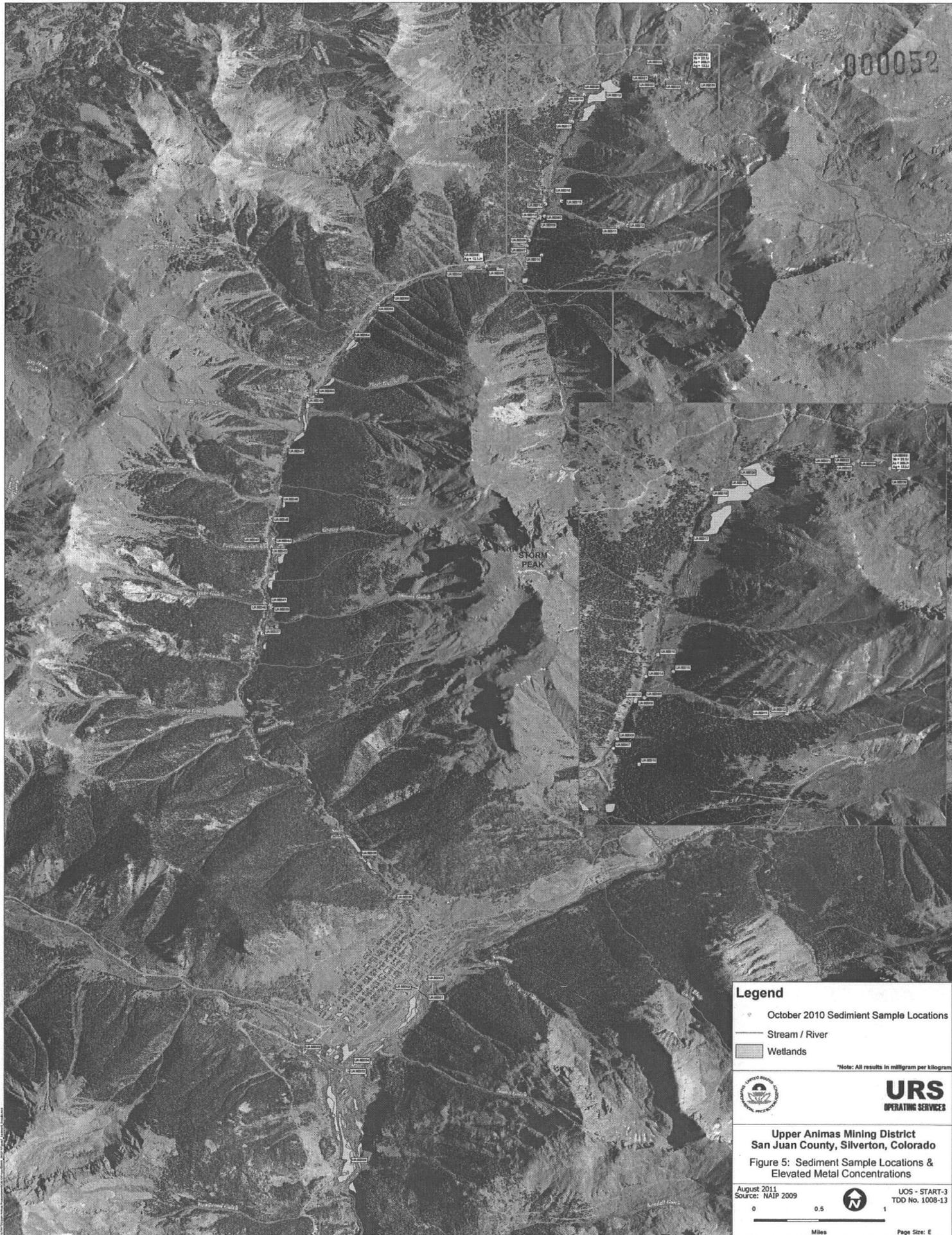


UOS - START-3
TDD No. 1008-13



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Legend

- ◻ October 2010 Sediment Sample Locations
- Stream / River
- ▨ Wetlands

*Note: All results in milligram per kilogram



URS
OPERATING SERVICES

Upper Animas Mining District
San Juan County, Silverton, Colorado
Figure 5: Sediment Sample Locations & Elevated Metal Concentrations

August 2011
Source: NAIP 2009



UOS - START-3
TDD No. 1008-13

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TABLE 1
Sample Locations and Rationale

Matrix	Sample #	ARSG Sample #	Location	Rationale	Notes	Latitude	Longitude
Surface Water	UASW001	-	Animas River downstream of the confluence with Cement Creek	Determine the impact of Cement Creek on the Animas River and the fisheries it supports		37.8095582	-107.6604985
Surface Water	UASW002	-	Cement Creek immediately upstream of the confluence with the Animas River	Determine contaminant concentrations in Cement Creek immediately upstream of the confluence with Animas River		37.8097218	-107.6605579
Surface Water	UASW003	A68	Animas River upstream of the confluence with Cement Creek	Establish background concentrations in the Animas River	1 of 5 Background Samples	37.8107356	-107.6595997
Surface Water	UASW004	-	Cement Creek downstream of the confluence with the South Fork of Cement Creek	Determine the impact of the South Fork of Cement Creek on Cement Creek		37.88922024	-107.6574425
Surface Water	UASW005	CC17	South Fork of Cement Creek	Determine contaminant concentrations in South Fork of Cement Creek	1 of 5 Background Samples, Duplicate, and MS/MSD	37.88958969	-107.6530445
Surface Water	UASW006	-	Cement Creek downstream of the American Tunnel and upstream of the confluence with the South Fork of Cement Creek	Determine the impact of the American Tunnel discharge on Cement Creek		37.8898256	-107.6531778
Surface Water	UASW007	CC18	Discharge from the American Tunnel immediately above confluence with Cement Creek	Determine contaminant concentrations in the American Tunnel Discharge		37.89187922	-107.6486617
Surface Water	UASW008	-	Cement Creek upstream of the American Tunnel	Determine contaminant concentrations in Cement Creek upstream of the confluence with the American Tunnel discharge		37.89248894	-107.6484147
Surface Water	UASW009	-	Cement Creek downstream of the confluence with the North Fork of Cement Creek	Determine the impact of the North Fork of Cement Creek on Cement Creek		37.89488872	-107.6472536
Surface Water	UASW010	-	North Fork of Cement Creek upstream of the confluence with Cement Creek	Determine contaminant concentrations in the North Fork of Cement Creek		37.89086142	-107.6470243
Surface Water	UASW011	-	North Fork of Cement Creek downstream of the Gold King 7 Level Mine – at road crossing	Determine the impact of the Gold King 7 Level Mine on Cement Creek		37.89397788	-107.6385926
Surface Water	UASW012	CC04	North Fork of Cement Creek upstream of the Gold King 7 Level Mine	Determine background in the North Fork of Cement Creek above Gold King 7 Level	1 of 5 Background Samples	37.89411581	-107.6375422
Surface Water	UASW013	-	Cement Creek upstream of the confluence with the North Fork of Cement Creek	Determine contaminant concentrations in Cement Creek upstream of the confluence with the North Fork of Cement Creek		37.89506486	-107.6472334
Surface Water	UASW014	-	Cement Creek downstream of Red and Bonita Mine	Determine the impact of Red and Bonita Mine on Cement Creek		37.89650119	-107.6466039
Surface Water	UASW015	CC0-3D	Drainage channel adjacent to county road below Red and Bonita	Determine contaminant concentrations at the base of the Red and Bonita piles		37.89682249	-107.6448356
Surface Water	UASW016	CC03B	Cement Creek upstream of Red and Bonita Mine	Determine contaminant concentrations in Cement Creek prior to the addition of Red and Bonita discharge		37.89790585	-107.6458382
Surface Water	UASW017	-	Cement Creek downstream of wetland that channels Mogul Mine drainage	Determine the impact of Mogul Mine drainage on Cement Creek		37.90556671	-107.6436829

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TABLE 1
Sample Locations and Rationale

Matrix	Sample #	ARSG Sample #	Location	Rationale	Notes	Latitude	Longitude
Surface Water	UASW018	-	Cement Creek upstream of wetland that contains Mogul Mine drainage	Determine contaminant concentrations in Cement Creek upstream of Mogul Mine		37.90855318	-107.6423561
Surface Water	UASW019	-	Mogul Mine drainage (in wetland)	Determine contaminant concentrations in Mogul Mine drainage	Duplicate and MS/MSD	37.90896776	-107.6399511
Surface Water	UASW020	-	Cement Creek upstream of Mogul Mine	Determine contaminant concentrations in Cement Creek upstream of Mogul Mine drainage		37.90990821	-107.6405736
Surface Water	UASW021	-	Cement Creek downstream of Mogul North Mine	Determine the impact of Mogul North Mine on Cement Creek		37.91066604	-107.6346712
Surface Water	UASW022	CC02A	Mogul North Mine discharge	Determine contaminant concentrations in Mogul North Mine discharge		37.91070324	-107.6344121
Surface Water	UASW023	CC01T	Cement Creek upstream of Mogul North Mine and downstream of confluence with Lower Ross	Determine contaminant concentrations in Cement Creek tributary upstream of Mogul North Mine		37.91019522	-107.6333027
Surface Water	UASW024	CC01S	Cement Creek downstream of Queen Anne Mine and upstream of confluence with Lower Ross	Determine contaminant concentrations in Cement Creek downstream of Queen Anne Mine and upstream of Mogul Mine		37.91039194	-107.6330064
Surface Water	UASW029	A72	Animas River Below Silverton			37.79040727	-107.6677567
Surface Water	UASW030	CC01F	Lower Ross Basin Drainage upstream of Grand Mogul Mine	Determine contaminant concentrations in Lower Ross Basin Drainage downstream of Adolphin Mine and upstream of Grand Mogul Mine	1 of 5 Background Samples	37.90926838	-107.6297553
Surface Water	UASW032	-	Animas River downstream of the confluence with Mineral Creek	Determine the impact of Mineral Creek on the Animas River		37.80064343	-107.6681545
Surface Water	UASW033	M34	Mineral Creek upstream of the confluence with the Animas River	Determine contaminant concentrations in Mineral Creek		37.80278383	-107.672785
Surface Water	UASW034	-	Animas River upstream of the confluence with Mineral Creek	Determine contaminant concentrations in the Animas River upstream of the confluence with Mineral Creek		37.80135406	-107.6675203
Surface Water	UASW035	CC48	Cement Creek downstream of the Kendrick-Gelder Smelter	Determine the impact of the Kendrick-Gelder smelter on Cement Creek	Duplicate and MS/MSD	37.81976805	-107.6630793
Surface Water	UASW036	-	Cement Creek upstream of the Kendrick-Gelder Smelter	Determine contaminant concentrations in Cement Creek upstream of Kendrick-Gelder Smelter		37.82414107	-107.6667121
Surface Water	UASW037	-	Cement Creek downstream of the Illinois Gulch drainage	Determine the impact of Illinois Gulch drainage on Cement Creek		37.84895488	-107.6774917
Surface Water	UASW039	-	Cement Creek upstream of the confluence with Illinois Gulch drainage and downstream of Ohio Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Illinois Gulch drainage and downstream of Ohio Gulch drainage		37.85179999	-107.6764859
Surface Water	UASW040	-	Ohio Gulch drainage	Determine contaminant concentrations in Ohio Gulch drainage		37.85201888	-107.6766856
Surface Water	UASW041	-	Cement Creek upstream of the confluence with Ohio Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Ohio Gulch drainage		37.85216376	-107.6765639

TABLE 1
Sample Locations and Rationale

Matrix	Sample #	ARSG Sample #	Location	Rationale	Notes	Latitude	Longitude
Surface Water	UASW042	-	Cement Creek downstream of the Anglo Saxon Mine drainage	Determine the impact of Anglo Saxon Mine drainage on Cement Creek		37.85854264	-107.6764944
Surface Water	UASW043	-	Anglo Saxon Mine drainage	Determine contaminant concentrations in Anglo Saxon Mine drainage		37.85900182	-107.6770285
Surface Water	UASW044	-	Cement Creek upstream of the Anglo Saxon Mine and downstream of Minnesota Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of the Anglo Saxon Mine and downstream of Minnesota Gulch drainage		37.85940622	-107.6762668
Surface Water	UASW045	-	Minnesota Gulch drainage	Determine contaminant concentrations in Minnesota Gulch drainage	1 of 5 Background Samples	37.86177679	-107.6765537
Surface Water	UASW046	-	Cement Creek upstream of the confluence with Minnesota Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Minnesota Gulch drainage		37.864032	-107.6755015
Surface Water	UASW047	-	Cement Creek downstream of the Elk Tunnel and Fairview Gulch	Determine the impact of the Elk Tunnel and Fairview Gulch on Cement Creek		37.86964659	-107.6746802
Surface Water	UASW049	-	Cement Creek upstream of the confluence with Fairview Gulch and the Elk Tunnel discharge and downstream of Georgia Gulch	Determine contaminant concentrations in Cement Creek upstream of Fairview Gulch and the Elk Tunnel Discharge and downstream of Georgia Gulch		37.87527629	-107.6726218
Surface Water	UASW050	-	Cement Creek upstream of Georgia Gulch and downstream of the Mammoth Tunnel	Determine the impact of the Mammoth Tunnel on Cement Creek		37.87583696	-107.6716351
Surface Water	UASW054	-	Prospect Gulch drainage	Determine contaminant concentrations in Prospect Gulch drainage		37.88252259	-107.6675612
Surface Water	UASW056	-	Cement Creek downstream of the Dry Gulch drainage	Determine the impact of Dry Gulch drainage on Cement Creek		37.885399	-107.6649774
Surface Water	UASW058	-	Cement Creek upstream of the confluence with Dry Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Dry Gulch drainage		37.88656029	-107.6632767
Surface Water/ Aqueous Source	UASW059	CC01C	Discharge from toe of Grand Mogul Mine	Determine contaminant contributions in Grand Mogul Mine Drainage		37.909906	-107.6309876
Surface Water/ Aqueous Source	UAAD001	CC19	American Tunnel discharge (at portal)	Determine contaminant concentrations in American Tunnel Discharge		37.89098103	-107.6484609
Surface Water/ Aqueous Source	UAAD002	CC06	Upper Gold King 7 Level Mine adit discharge	Determine contaminant concentrations in Gold King 7 Level Mine adit Discharge		37.89459073	-107.6383929
Surface Water/ Aqueous Source	UAAD003	CC03C	Red and Bonita Mine adit discharge	Determine contaminant concentrations in Red and Bonita Mine adit Discharge		37.89727185	-107.6438928
Surface Water/ Aqueous Source	UAAD004	CC02D	Mogul Mine adit discharge	Determine contaminant concentrations in Mogul Mine adit Discharge		37.91000846	-107.6382162
Surface Water	UASW097	-	Duplicate Sample and MS/MSD Sample: Dup of UASW035	MS/MSD is collected to test the precision of laboratory analytical methods. Duplicate is collected to document the precision of sample collection procedures and laboratory analysis.		37.81976805	-107.6630793

TABLE 1
Sample Locations and Rationale

Matrix	Sample #	ARSG Sample #	Location	Rationale	Notes	Latitude	Longitude
Surface Water	UASW098	-	Duplicate Sample and MS/MSD Sample: Dup of UASW005	MS/MSD is collected to test the precision of laboratory analytical methods. Duplicate is collected to document the precision of sample collection procedures and laboratory analysis.		37.88958969	-107.6530445
Surface Water	UASW099	-	Duplicate Sample and MS/MSD Sample: Dup of UASW019	MS/MSD is collected to test the precision of laboratory analytical methods. Duplicate is collected to document the precision of sample collection procedures and laboratory analysis.		37.90896776	-107.6399511
Sediment	UASE001	-	Animas River downstream of the confluence with Cement Creek	Determine the impact of Cement Creek on the Animas River and the fisheries it supports		37.80955582	-107.6604985
Sediment	UASE002	-	Cement Creek immediately upstream of the confluence with the Animas River	Determine contaminant concentrations in Cement Creek immediately upstream of the confluence with Animas River		37.8097218	-107.6605579
Sediment	UASE003	A68	Animas River upstream of the confluence with Cement Creek	Establish background concentrations in the Animas River	1 of 5 Background Samples	37.8107356	-107.6595997
Sediment	UASE004	-	Cement Creek downstream of the confluence with the South Fork of Cement Creek	Determine the impact of the South Fork of Cement Creek on Cement Creek		37.88922024	-107.6574425
Sediment	UASE005	CC17	South Fork of Cement Creek	Determine contaminant concentrations in South Fork of Cement Creek	1 of 5 Background Samples, Duplicate, and MS/MSD	37.88958969	-107.6530445
Sediment	UASE006	-	Cement Creek downstream of the American Tunnel and upstream of the confluence with the South Fork of Cement Creek	Determine the impact of the American Tunnel discharge on Cement Creek		37.8898256	-107.6531778
Sediment	UASE007	CC18	Discharge from the American Tunnel immediately above confluence with Cement Creek	Determine contaminant concentrations in the American Tunnel Discharge		37.89187922	-107.6486617
Sediment	UASE008	-	Cement Creek upstream of the American Tunnel	Determine contaminant concentrations in Cement Creek upstream of the confluence with the American Tunnel discharge		37.89248894	-107.6484147
Sediment	UASE009	-	Cement Creek downstream of the confluence with the North Fork of Cement Creek	Determine the impact of the North Fork of Cement Creek on Cement Creek		37.89488872	-107.6472536
Sediment	UASE010	-	North Fork of Cement Creek upstream of the confluence with Cement Creek	Determine contaminant concentrations in the North Fork of Cement Creek	This sample was re-collected and labeled UASE060, due to uncertainty if sufficient volume of fines was obtained in initial sample.	37.89086142	-107.6470243
Sediment	UASE011	-	North Fork of Cement Creek downstream of the Gold King 7 Level Mine – at road crossing	Determine the impact of the Gold King 7 Level Mine on Cement Creek		37.89397788	-107.6385926
Sediment	UASE012	-	North Fork of Cement Creek upstream of the Gold King 7 Level Mine	Determine background in the North Fork of Cement Creek above Gold King 7 Level	1 of 5 Background Samples	37.89411581	-107.6375422
Sediment	UASE013	-	Cement Creek upstream of the confluence with the North Fork of Cement Creek	Determine contaminant concentrations in Cement Creek upstream of the confluence with the North Fork of Cement Creek		37.89506486	-107.6472334

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TABLE 1
Sample Locations and Rationale

Matrix	Sample #	ARSG Sample #	Location	Rationale	Notes	Latitude	Longitude
Sediment	UASE014	-	Cement Creek downstream of Red and Bonita Mine	Determine the impact of Red and Bonita Mine on Cement Creek		37.89650119	-107.6466039
Sediment	UASE015	CC03D	Drainage channel adjacent to county road below Red and Bonita	Determine contaminant concentrations at the base of the Red and Bonita piles		37.89682249	-107.6448356
Sediment	UASE016	CC03B	Cement Creek upstream of Red and Bonita Mine	Determine contaminant concentrations in Cement Creek prior to the addition of Red and Bonita discharge		37.89790585	-107.6458382
Sediment	UASE017	-	Cement Creek downstream of wetland that channels Mogul Mine drainage	Determine the impact of Mogul Mine drainage on Cement Creek		37.90556671	-107.6436829
Sediment	UASE018	-	Cement Creek upstream of wetland that contains Mogul Mine drainage	Determine contaminant concentrations in Cement Creek upstream of Mogul Mine		37.90855318	-107.6423561
Sediment	UASE019	-	Mogul Mine drainage (in wetland)	Determine contaminant concentrations in Mogul Mine drainage	Duplicate and MS/MSD	37.90896776	-107.6399511
Sediment	UASE020	-	Cement Creek upstream of Mogul Mine	Determine contaminant concentrations in Cement Creek upstream of Mogul Mine drainage		37.90990821	-107.6405736
Sediment	UASE021	-	Cement Creek downstream of Mogul North Mine	Determine the impact of Mogul North Mine on Cement Creek		37.91066604	-107.6346712
Sediment	UASE022	CC02A	Mogul North Mine discharge	Determine contaminant concentrations in Mogul North Mine discharge		37.91070324	-107.6344121
Sediment	UASE023	CC01T	Cement Creek upstream of Mogul North Mine and downstream of confluence with Lower Ross	Determine contaminant concentrations in Cement Creek tributary upstream of Mogul North Mine		37.91019522	-107.6333027
Sediment	UASE024	CC01S	Cement Creek downstream of Queen Anne Mine and upstream of confluence with Lower Ross	Determine contaminant concentrations in Cement Creek downstream of Queen Anne Mine and upstream of Mogul Mine		37.91039194	-107.6330064
Sediment	UASE029	A72	Animas River Below Silverton			37.79040727	-107.6677567
Sediment	UASE030	CC01F	Lower Ross Basin Drainage upstream of Grand Mogul Mine	Determine contaminant concentrations in Lower Ross Basin Drainage downstream of Adelphin Mine and upstream of Grand Mogul Mine	1 of 5 Background Samples	37.90926838	-107.6297553
Sediment	UASE032	-	Animas River downstream of the confluence with Mineral Creek	Determine the impact of Mineral Creek on the Animas River		37.80064343	-107.6681545
Sediment	UASE033	M34	Mineral Creek upstream of the confluence with the Animas River	Determine contaminant concentrations in Mineral Creek		37.80278383	-107.672785
Sediment	UASE034	-	Animas River upstream of the confluence with Mineral Creek	Determine contaminant concentrations in the Animas River upstream of the confluence with Mineral Creek		37.80135406	-107.6675203
Sediment	UASE035	CC48	Cement Creek downstream of the Kendrick-Gelder Smelter	Determine the impact of the Kendrick-Gelder smelter on Cement Creek	Duplicate and MS/MSD	37.81976805	-107.6630793
Sediment	UASE036	-	Cement Creek upstream of the Kendrick-Gelder Smelter	Determine contaminant concentrations in Cement Creek upstream of Kendrick-Gelder Smelter		37.82414107	-107.6667121
Sediment	UASE037	-	Cement Creek downstream of the Illinois Gulch drainage	Determine the impact of Illinois Gulch drainage on Cement Creek		37.84895488	-107.6774917

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TABLE 1
Sample Locations and Rationale

Matrix	Sample #	ARSG Sample #	Location	Rationale	Notes	Latitude	Longitude
Sediment	UASE039	-	Cement Creek upstream of the confluence with Illinois Gulch drainage and downstream of Ohio Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Illinois Gulch drainage and downstream of Ohio Gulch drainage		37.85179999	-107.6764859
Sediment	UASE040	-	Ohio Gulch drainage	Determine contaminant concentrations in Ohio Gulch drainage		37.85201888	-107.6766856
Sediment	UASE041	-	Cement Creek upstream of the confluence with Ohio Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Ohio Gulch drainage		37.85216376	-107.6765639
Sediment	UASE042	-	Cement Creek downstream of the Anglo Saxon Mine drainage	Determine the impact of Anglo Saxon Mine drainage on Cement Creek		37.85854264	-107.6764944
Sediment	UASE043	-	Anglo Saxon Mine drainage	Determine contaminant concentrations in Anglo Saxon Mine drainage		37.85900182	-107.6770285
Sediment	UASE044	-	Cement Creek upstream of the Anglo Saxon Mine and downstream of Minnesota Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of the Anglo Saxon Mine and downstream of Minnesota Gulch drainage		37.85940622	-107.6762668
Sediment	UASE045	-	Minnesota Gulch drainage	Determine contaminant concentrations in Minnesota Gulch drainage	1 of 5 Background Samples	37.86177679	-107.6765537
Sediment	UASE046	-	Cement Creek upstream of the confluence with Minnesota Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Minnesota Gulch drainage		37.864032	-107.6755015
Sediment	UASE047	-	Cement Creek downstream of the Elk Tunnel and Fairview Gulch	Determine the impact of the Elk Tunnel and Fairview Gulch on Cement Creek		37.86964659	-107.6746802
Sediment	UASE049	-	Cement Creek upstream of the confluence with Fairview Gulch and the Elk Tunnel discharge and downstream of Georgia Gulch	Determine contaminant concentrations in Cement Creek upstream of Fairview Gulch and the Elk Tunnel Discharge and downstream of Georgia Gulch		37.87527629	-107.6726218
Sediment	UASE050	-	Cement Creek upstream of Georgia Gulch and downstream of the Mammoth Tunnel	Determine the impact of the Mammoth Tunnel on Cement Creek		37.87583696	-107.6716351
Sediment	UASE054	-	Prospect Gulch drainage	Determine contaminant concentrations in Prospect Gulch drainage		37.88252259	-107.6675612
Sediment	UASE056	-	Cement Creek downstream of the Dry Gulch drainage	Determine the impact of Dry Gulch drainage on Cement Creek		37.885399	-107.6649774
Sediment	UASE058	-	Cement Creek upstream of the confluence with Dry Gulch drainage	Determine contaminant concentrations in Cement Creek upstream of Dry Gulch drainage		37.88656029	-107.6632767
Sediment	UASE059	CCO1C	Cement Creek at the toe of Grand Mogul Mine	Determine contaminant contributions in Grand Mogul Mine Drainage		37.909906	-107.6309876
Sediment	UASE060	-	Re-collect of UASE010: North Fork of Cement Creek upstream of the confluence with Cement Creek	Determine contaminant concentrations in the North Fork of Cement Creek	This sample was collected due to uncertainty if sufficient volume of fines was obtained in initial sample.	37.89086142	-107.6470243
Sediment	UASE097	-	Duplicate Sample and MS/MSD Sample: Dup of UASE035	MS/MSD is collected to test the precision of laboratory analytical methods. Duplicate is collected to document the precision of sample collection procedures and laboratory analysis.		37.81976805	-107.6630793

TABLE 1
Sample Locations and Rationale

Matrix	Sample #	ARSG Sample #	Location	Rationale	Notes	Latitude	Longitude
Sediment	UASE098	-	Duplicate Sample and MS/MSD Sample: Dup of UASE005	MS/MSD is collected to test the precision of laboratory analytical methods. Duplicate is collected to document the precision of sample collection procedures and laboratory analysis.		37.88958969	-107.6530445
Sediment	UASE099	-	Duplicate Sample and MS/MSD Sample: Dup of UASE019	MS/MSD is collected to test the precision of laboratory analytical methods. Duplicate is collected to document the precision of sample collection procedures and laboratory analysis.		37.90896776	-107.6399511
Soil	UASO001	-	American Tunnel	Characterize source in vicinity of American Tunnel		37.89133065	-107.6486362
Soil	UASO002	-	American Tunnel	Characterize source in vicinity of American Tunnel		37.89117702	-107.6483629
Soil	UASO003	-	Red and Bonita Mine – top pile	Characterize source at Red and Bonita Mine		37.8972027	-107.6440184
Soil	UASO004	-	Red and Bonita Mine – middle pile	Characterize source at Red and Bonita Mine		37.89732528	-107.6443866
Soil	UASO005	-	Red and Bonita Mine – bottom pile	Characterize source at Red and Bonita Mine		37.89746138	-107.6445318
Soil	UASO006	-	Mogul North Mine waste pile	Characterize source at North Mogul Mine		37.91066912	-107.6340085
Soil	UASO007	-	Grand Mogul stope – west side	Characterize source at Grand Mogul Stope		37.91046051	-107.6318807
Soil	UASO008	-	Grand Mogul stope – east side	Characterize source at Grand Mogul Stope		37.91035316	-107.6315761
Soil	UASO009	-	Grand Mogul Mine waste piles – east side	Characterize source at Grand Mogul Mine		37.91001981	-107.6303379
Soil	UASO010	-	Grand Mogul Mine waste piles – center	Characterize source at Grand Mogul Mine		37.90994872	-107.6304505
Soil	UASO011	-	Grand Mogul Mine waste piles – west side	Characterize source at Grand Mogul Mine		37.91005883	-107.6306195
Soil	UASO012	-	Mogul Mine waste piles – west side	Characterize source at Mogul Mine		37.91014558	-107.6388884
Soil	UASO013	-	Mogul Mine waste piles – adjacent to shed	Characterize source at Mogul Mine		37.9099109	-107.6384627
Soil	UASO014	-	Mogul Mine waste piles – east side	Characterize source at Mogul Mine		37.90982638	-107.6385486

ARSG Animas River Stakeholders Group

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TABLE 2
Source Samples - Adit Discharges
(µg/L)

Field Sample ID: ARSG ID: Location: Analysis:	UAAD001 (CC19) American Tunnel discharge (at portal) Total Metals	UAAD002 (CC06) Upper Gold King 7 Level Mine adit discharge Total Metals	UAAD003 (CC03C) Red and Bonita Mine adit discharge Total Metals	UAAD004 (CC02D) Mogul Mine adit discharge Total Metals	UAAD001 (CC19) American Tunnel discharge (at portal) Dissolved Metals	UAAD002 (CC06) Upper Gold King 7 Level Mine adit discharge Dissolved Metals	UAAD003 (CC03C) Red and Bonita Mine adit discharge Dissolved Metals	UAAD004 (CC02D) Mogul Mine adit discharge Dissolved Metals	UASW059 (CC01C) Toe of Grand Mogul Mine Dissolved Metals (only)
Analytes									
Aluminum	5,520	18,500	4,680	3,330	4,990	18,300	4,620	3,300	13,200
Antimony	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	2.50 U
Arsenic	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.72 JD	26.9 ☆
Barium	50 U	50 U	50 U	50 U	50 U	50 U	50 U	25 U	25.0 U
Beryllium	4.18 D	7.03 D	8.4 D	4.82 D	3.7 D	5.98 D	6.45 D	4.49 D	0.940 J
Cadmium	1.97 JD	54.9 D	53.1 D	55 D	2.02 D	53 D	48.7 D	50.9 D	105
Calcium	457,000	398,000	441,000	212,000	434,000	395,000	442,000	211,000	17,400
Chromium	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	5.46
Cobalt	133 D	79.1 D	97.4 D	22.3 D	136 D	84.4 D	102 D	22.5 D	25.6
Copper	5 U	4,030 D	5 U	15.3 D	5 U	4,210 D	5 U	20.9 D	4,690
Iron	144,000	73,700	102,000	31,900	133,000	71,600	101,000	27,200	46,400
Lead	3.7 D	6.82 D	107 D	271 D	1.12 JD	5.66 D	98.7 D	255 D	33.8
Magnesium	31,600	22,800	28,700	13,200	29,900	22,600	28,600	13,200	12,000
Manganese	44,000	28,000	30,700	28,700	41,700	27,800	30,500	29,100	8,740
Molybdenum	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1.54 JD	1.99 JD	0.500 U
Nickel	46.3 D	31.2 D	38.2 D	6.74 JD	47.8 D	35.4 D	42.6 D	8.3 D	16.4
Potassium	1,790	1,810	1,860	2,040	1,680	1,790	1,840	2,000	362 J
Selenium	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	2.50 U
Silver	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.500 U
Sodium	9,610	5,350	8,730	6,280	9,080	5,260	8,530	6,210	626
Thallium	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	2.50 U
Vanadium	10 U	10 U	10 U	10 U	10 U	10 U	10 U	5 U	5.00 U
Zinc	19,100	18,700	15,500	31,300	18,100	18,600	15,400	32,700	24,900

µg/L micrograms per liter
 J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the element is reliable.
 U The analyte was not detected at or above the CRDL.
 UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element may not be present the sample.
 D The analyte was identified in a sample at a secondary dilution factor.
 Sources: EPA 2004 (SCDM)

000060

TABLE 3
Source Samples – Adit Sediments
mg/kg (ppm)

Field Sample ID: Location:	UAAD001 American Tunnel discharge (at portal)	UAAD002 Upper Gold King 7 Level Mine adit discharge	UAAD003 Red and Bonita Mine adit discharge	UAAD004 Mogul Mine adit discharge	UASE059 Toe of Grand Mogul Mine
Analytes					
Aluminum	5,480	3,170	4,960	2,320	986
Antimony	3.2 UJ	2.9 UJ	5.6 J	3.1 UJ	23.3 J
Arsenic	19.1 J	43.9 J	126 J	49.1 J	969 J+)
Barium	17.4	3.5	21.4	41.3	37.1 J+
Beryllium	1.6 U	1.5 UJ	1.7 UJ	1.5 UJ	3 UJ
Cadmium	1.6 U	1.5 UJ	1.7 UJ	1.5 UJ	3 UJ
Calcium	1,580 U	1,490	1,820	1,530 U	2,980 U
Chromium	3.2 U	2.9 UJ	7.4 J	2.2 J	11.3
Cobalt	1.6 UJ	2.9 UJ	3.4 U	16.6	3 UJ
Copper	20.2	11 J	369 J	32.8 J	235 J+
Iron	359,000	445,000	519,000	462,000	273,000
Lead	115 J	1,740	59.4	419	1,100 J
Magnesium	644	1,460 U	1,680 U	1,530 U	2,980 U
Manganese	280	107 J	130 J	2,110 J	304
Nickel	1.6 U	1.5 UJ	1.7 UJ	1.7 J	3 UJ
Potassium	146 J+	1,460 U	1,680 U	1,530 U	2,980 U
Selenium	7.9 UJ	7.3 UJ	8.4 UJ	7.6 UJ	15 U
Silver	1.6 UJ	1.5 UJ	1.7 UJ	1.5 UJ	13.2 J
Sodium	31.2 J+	1,460 U	1,680 U	1,530 U	2,980 UJ
Thallium	1.6 J+	1.5 UJ	1.7 UJ	1.5 UJ	0.19 J-
Vanadium	45.9	12.4	88	12	57.1
Zinc	282 J	361 J-	63.3 J-	232 J-	524 J

mg/kg milligrams per kilogram
 ppm parts per million
 J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the element is reliable.
 U The analyte was not detected at or above the CRDL.
 UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element may not be present the sample.
 J- The associated numerical value is an estimated quantity but the result may be biased low.
 J+ The associated numerical value is an estimated quantity but the result may be biased high.

TABLE 4
Source Samples – Mine Waste
mg/kg (ppm)

Field Sample ID: Location:	UASO001 American Tunnel	UASO002 American Tunnel	UASO003 Red and Bonita Mine – top pile	UASO004 Red and Bonita Mine – middle pile	UASO005 Red and Bonita Mine – bottom pile	UASO006 Mogul North Mine waste pile	UASO007 Grand Mogul stope – west side	UASO008 Grand Mogul stope – east side	UASO009 Grand Mogul Mine waste piles – east side	UASO010 Grand Mogul Mine waste piles – center	UASO011 Grand Mogul Mine waste piles – west side	UASO012 Mogul Mine waste piles – west side	UASO013 Mogul Mine waste piles – adjacent to shed	UASO014 Mogul Mine waste piles – east side
Analytes														
Aluminum	13,900	12,900	8,780	1,470	2,260	1,130	1,450	2,020	11,200	665	13,000	906	3,270	19,500
Antimony	1.3 UJ	1.2 UJ	1.8 J	1.3 U	12 J	13.5 J	11.7 J	1.1 U	1.1 U	12.2 J	1.1 U	1.1 U	3.6 J	1.2 U
Arsenic	23.7 J	13.5 J	9.1 J+	15.7 J+	29.3 J+	34.9 J+	38.6 J+	90.2 J+	96.8 J+	55.2 J+	32.8 J+	13.6 J+	37.7 J+	31.9 J+
Barium	117	113	105 J+	18.7 J+	68.3 J+	83.8 J+	97.2 J+	72.1 J+	34.9 J+	81.3 J+	46.1 J+	37.1 J+	68.4 J+	154 J+
Beryllium	0.64 UJ	0.6 UJ	0.6 UJ	0.65 UJ	0.78 UJ	0.56 UJ	0.55 UJ	0.57 UJ	0.55 UJ	0.54 UJ	0.54 UJ	0.55 UJ	0.55 UJ	0.79 J+
Cadmium	9.6 J	0.6 UJ	0.63 J	0.65 UJ	35.4 J	5 J	7.6 J	1.1 J	0.55 UJ	40 J	0.7 J	0.55 UJ	9 J	3.7 J
Calcium	5,910	2,080	1,780	648 U	775 U	563 U	551 U	807	1,360	535 U	2,030	554 U	547 U	1,540
Chromium	8.4 J	10 J	4.9	1.8	2.2	1.3	1.1 U	2.3	11.9	1.1 U	10	1.1 U	2.7	9.9
Cobalt	8	6.8	1.3	1	0.78 U	0.56 U	0.55 U	0.88	5.5	0.54 U	4.6	0.55 U	1.5	21.4
Copper	244 J	40.6 J	195 J+	104 J+	286 J+	211 J+	471 J+	111 J+	47.1 J+	4,600 J+	33.1 J+	63.1 J+	285 J+	162 J+
Iron	47,800	36,900	102,000	150,000	308,000	8,170	16,900	21,500	36,000	22,200	25,200	7,700	46,300	55,900
Lead	1,820	241	6,440 J	1,850 J	5,080 J	3,880 J	4,920 J	4,510 J	1,030 J	15,500 J	2,260 J	1,050 J	3,170 J	1,070 J
Magnesium	11,200	10,700	5,600	648 U	775 U	563 U	551 U	950	11,100	535 U	12,700	554 U	1,920	9,940
Manganese	1,180 J	796 J	452	630	136	423	122	852	1,620	177	3,280	135	433	5,570
Nickel	5.8 J	6.6 J	2.3 J	1.3 J	0.78 UJ	0.56 UJ	0.55 UJ	0.74 J	5.3 J	0.54 UJ	5.3 J	0.55 UJ	1.4 J	9.5 J
Potassium	1,070 J+	1,030 J+	790 J	648 U	775 U	714 J+	1,240 J+	1,460 J+	872 J+	1,200 J+	671 J+	961 J+	769 J+	1,090 J+
Selenium	3.2 UJ	3 UJ	3 U	3.2 U	3.9 U	2.8 U	2.8 U	2.8 U	2.8 U	3.4	2.7 U	2.8 U	2.7 U	3 U
Silver	5.4 J	1.3 J	103 J	10.4 J	27.5 J	34.6 J	54 J	8.4 J	5.7 J	113 J	4.6 J	6.9 J	22.9 J	2.7 J
Sodium	640 U	605 U	604 UJ	648 U	775 U	563 UJ	551 UJ	569 UJ	552 UJ	535 UJ	541 UJ	554 UJ	547 UJ	597 UJ
Thallium	0.64 UJ	0.6 UJ	0.5	0.23 J-	0.1 J-	0.61	0.85	1.2	0.36 J-	0.73	0.38 J-	0.43 J-	0.37 J-	0.56
Vanadium	53.6	65.3	26	23.7	49.7	7.8	12	17.5	62.1	7.1	60.8	4.9	15.4	47.5
Zinc	2,610 J-	102 J-	167 J	265 J	11,300 J	1,400 J	2,100 J	319 J	187 J	10,400 J	210 J	140 J	2,580 J	498 J

mg/kg milligrams per kilogram
 ppm parts per million
 J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the element is reliable.
 U The analyte was not detected at or above the CRDL.
 UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element may not be present the sample.
 J- The associated numerical value is an estimated quantity but the result may be biased low.
 J+ The associated numerical value is an estimated quantity but the result may be biased high.

TABLE 5
Highest Background Analyte Value Selected from 5 Surface Water Background Locations
Dissolved Metals
µg/L (ppb)

Field Sample ID: Location:	Highest Selected Background Value	UASW003 (A68) Animas River upstream of confluence with Cement Creek	UASW005 (CC17) South Fork of Cement Creek	UASW012 North Fork of Cement Creek upstream of the Gold King 7 Level Mine	UASW030 (CC01F) Lower Ross Basin Drainage upstream of Grand Mogul Mine	UASW045 Minnesota Gulch Drainage
Analytes						
Aluminum	4,280	86.2	720	3,820	69.0	4,280
Antimony	2.5 U	2.5 U	2.5 U	2.5 U	2.50 U	2.5 U
Arsenic	2.5 U	2.5 U	2.5 U	2.5 U	2.50 U	2.5 U
Barium	30.8	25 U	25 U	25 U	30.8 J	29 J
Beryllium	1.05	0.5 U	0.5 U	0.595 J	0.500 U	1.05
Cadmium	4.69	1.82	2.73	4.69	3.09	3.79
Calcium	162,000	54,300	162,000	52,500	46,200	52,700
Chromium	2.56 J	2.5 U	2.5 U	2.56 J	2.50 U	2.5 U
Cobalt	20.6	0.5 U	7.71	7.94	0.500 U	20.6
Copper	291	2.5 U	8.83	291	25.2	150
Iron	3,230	100 U	3,230	100 U	100 U	268
Lead	9.44	0.79 J	0.643 J	4.50	0.620 J	9.44
Magnesium	9,690	3,290	8,230	7,230	4,060	9,690
Manganese	1,940	1,940	1,840	742	120	1,620
Molybdenum	3.63	3.63	0.535 J	0.5 U	0.500 U	0.5 U
Nickel	13.6	2.5 U	2.5 U	5.44	2.50 U	13.6
Potassium	747 J	614 J	747 J	545 J	294 J	714 J
Selenium	2.5 U	2.5 U	2.5 U	2.5 U	2.50 U	2.5 U
Silver	0.843 J	0.843 J	0.5 U	.50 U	0.500 U	0.5 U
Sodium	3,470	2,460	3,470	2,040	1,230	1,620
Thallium	15.4	15.4	2.5 U	5.00 U	2.50 U	2.5 U
Vanadium	5.0 U	5.0 U	5.0 U	1.00 U	5.00 U	5.0 U
Zinc	924	449	647	924	556	907

J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the analyte is reliable.
 U The analyte was not detected above the CRQL.
 µg/L micrograms per liter
 BOLD Background value

000063

TABLE 6
Surface Water Dissolved Metals Analytical Summary
 Concentrations in micrograms per liter (µg/L) parts per billion (ppb)

Field Sample ID:	Location:	Superfund Chemical Data Matrix (SCDM) Environmental Acute (µg/L)	Superfund Chemical Data Matrix (SCDM) Environmental Chronic (µg/L)	Highest Selected Background Value (from Table 5)	UASW030 (CC01F) Lower Ross Basin Drainage upstream of Grand Mogul Mine (1 of 5 Backgrounds)	UASW024 (CC01S) Drainage from Queen Anne Mine upstream of Lower Ross Basin (source)	UASW023 (CC01T) Cement Creek upstream of Mogul North Mine & downstream of Lower Ross Basin (source)	UASW022 (CC02A) Mogul Mine North Discharge (source)	UASW021 Cement Creek downstream of Mogul North Mine	UASW020 Cement Creek upstream of Mogul Mine	UASW018 Cement Creek upstream of wetland that contains Mogul Mine drainage
Aluminum		750	87	4,280	69.0	2,180	1,580	1,430	1,520	996	2,830
Antimony		-	-	2.5 U	2.50 U	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U
Arsenic		340	150	2.5 U	2.50 U	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U
Barium		-	-	30.8	30.8 J	34.7 J	29.1 J	39.4 J	26.3 J	25.0 U	25.0 U
Beryllium		-	-	1.05	0.500 U	0.968 J	0.500 U	0.5 U	0.649 J	0.500 U	0.760 J
Cadmium		2.0	0.25	4.69	3.09	16.9	13.6	10.9	12.0	8.88	19.2 ★
Calcium		-	-	162,000	46,200	72,700	55,400	62,000	55,900	45,100	71,600
Chromium		-	-	2.56 J	2.50 U	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U
Cobalt		-	-	20.6	0.500 U	0.5 U	0.500 U	0.5 U	0.500 U	0.500 U	3.02
Copper		13	9.0	291	25.2	36.6	102	22.3	105	91.1	240
Iron		-	1,000	3,230	100 U	100 U	100 U	100 U	100 U	100 U	413
Lead		65	2.5	9.44	0.620 J	2.21	2.03	2.54	2.62	4.01	11.9
Magnesium		-	-	9,690	4,060	9,760	7,020	8,310	7,150	5,520	6,880
Manganese		-	-	1,940	120	977	633	111	550	306	4,040
Molybdenum		-	-	3.63	0.500 U	0.5 U	0.500 U	0.5 U	0.500 U	0.500 U	0.500 U
Nickel		470	52	13.6	2.50 U	12.1	6.06	9.47	6.43	4.42 J	5.71
Potassium		-	-	747 J	294 J	561 J	250 J	634 J	517 J	462 J	593 J
Selenium		-	5.0	2.5 U	2.50 U	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U
Silver		180	-	0.843 J	0.500 U	0.5 U	0.500 U	0.5 U	0.500 U	0.500 U	0.500 U
Sodium		-	-	3,470	1,230	1,340	1,280	1,260	1,260	1,150	2,190
Thallium		-	-	15.4	2.50 U	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U
Vanadium		260	-	5.0 U	5.00 U	5 U	5.00 U	5 U	5.00 U	5.00 U	5.00 U
Zinc		120	120	924	556	3,230	2,750	3,080	2,550	1,920	5,950 ★

000064

TABLE 6, cont.
Surface Water Dissolved Metals Analytical Summary
Concentrations in micrograms per liter (µg/L) parts per billion (ppb)

Field Sample ID: Location: Analytes	Superfund Chemical Data Matrix (SCDM) Environmental Acute (µg/L)	Superfund Chemical Data Matrix (SCDM) Environmental Chronic (µg/L)	Highest Selected Background Value (from Table 5)	UASW019 Wetlands through which Mogul mine drains to Cement Creek (source)	UASW017 Cement Creek downstream of wetland that channels Mogul Mine drainage	UASW016 (OPP12) Cement Creek upstream of Red and Bonita Mine	UASW015 CC03D Drainage from Red & Bonita Mine before the culvert under the road (source)	UASW014 Cement Creek downstream of Red and Bonita Mine	UASW013 Cement Creek upstream of the confluence with the North Fork of Cement Creek	UASW012 North Fork of Cement Creek upstream of Gold King 7 Level Mine (1 of 5 backgrounds)	UASW011 North Fork of Cement Creek downstream of Gold King 7 Level Mine
Aluminum	750	87	4,280	10,100	2,570	2,480	3,040	4,980	3,550	3,820	18,100 ★
Antimony	-	-	2.5 U	2.5 U	2.50 U	2.50 U	5 U	2.50 U	2.50 U	2.5 U	5 U
Arsenic	340	150	2.5 U	2.5 U	2.50 U	2.50 U	5 U	2.50 U	2.50 U	2.5 U	5 U
Barium	-	-	30.8	25 U	25.0 U	25.0 U	50 U	25.0 U	25.0 U	25U	50 U
Beryllium	-	-	1.05	3.8	1.08	0.500 U	6.95	3.03	2.73	0.595 J	7.06 ☆
Cadmium	2.0	0.25	4.69	72.8	15.8 ★	13.7	42.2	25.8 ★	22.0 ★	4.69	53.3 ★
Calcium	-	-	162,000	174,000	81,400	87,800	450,000	231,000	210,000	52,500	388,000
Chromium	-	-	2.56 J	2.5 U	2.50 U	2.50 U	5 U	2.50 U	2.50 U	2.56 J	5 U
Cobalt	-	-	20.6	22.6	2.34	1.83	95.9	46.0	36.3	7.94	81.4 ☆
Copper	13	9.0	291	820	201	140	5 U	121	128	291	4,580 ★
Iron	-	1,000	3,230	4,460	186 J	210 J	95,200	30,600 ★	27,700 ★	100 U	66,700 ★
Lead	65	2.5	9.44	75.6	12.6	7.42	13.1	16.1	13.3	4.5	5.66
Magnesium	-	-	9,690	13,600	6,280	6,010	28,900	15,700	14,000	7,230	22,300
Manganese	-	-	1,940	21,900	3,370	3,000	31,900	14,900 ☆	12,800 ☆	742	26,000 ☆
Molybdenum	-	-	3.63	0.5 U	0.500 U	0.500 U	1 U	0.500 U	0.500 U	0.5 U	1 U
Nickel	470	52	13.6	13.6	4.23 J	3.23 J	38.6	20.2	16.3	5.44	35.8
Potassium	-	-	747 J	1,420	568 J	532 J	1,850	920 J	874 J	545 J	1,790
Selenium	-	5.0	2.5 U	2.5 U	2.50 U	2.50 U	5 U	2.50 U	2.50 U	2.5 U	5 U
Silver	180	-	0.843 J	0.5 U	0.500 U	0.500 U	1 U	0.500 U	0.500 U	0.5 U	1 U
Sodium	-	-	3,470	5,520	2,610	2,890	8,800	5,430	4,980	2,040	5,240
Thallium	-	-	15.4	2.5 U	2.50 U	2.50 U	5 U	2.50 U	2.50 U	2.5 U	5 U
Vanadium	260	-	5.0 U	5 U	5.00 U	5.00 U	10 U	5.00 U	5.00 U	5 U	10 U
Zinc	120	120	924	27,600	4,910 ★	4,640 ★	15,500	8,770 ★	7,890 ★	924	17,100 ★

TABLE 6, cont.
Surface Water Dissolved Metals Analytical Summary
Concentrations in micrograms per liter (µg/L) parts per billion (ppb)

Field Sample ID: Location:	Superfund Chemical Data Matrix (SCDM) Environmental Acute (µg/L)	Superfund Chemical Data Matrix (SCDM) Environmental Chronic (µg/L)	Highest Selected Background Value (from Table 5)	UASW010 North Fork of Cement Creek upstream of confluence with Cement Creek	UASW009 Cement Creek downstream of the confluence with the North Fork of Cement Creek	UASW008 Cement Creek upstream of the American Tunnel	UASW007 (CC18) Discharge from American Tunnel immediately above confluence with Cement Creek (source)	UASW006 Cement Creek downstream of the American Tunnel and upstream of the confluence with the South Fork of Cement Creek	UASW005 (CC17) South Fork of Cement Creek (1 of 5 backgrounds)	UASW004 Cement Creek downstream of confluence with the South Fork of Cement Creek	UASW058 Cement Creek upstream of the confluence with Dry Gulch drainage
Aluminum	750	87	4,280	23,500 ★	7,030	7,940	5,730	9,160	720	5,130	5,510 ★
Antimony	-	-	2.5 U	5 U	2.50 U	2.50 U	5 U	2.50 U	2.5 U	2.50 U	2.50 U
Arsenic	340	150	2.5 U	5 U	2.50 U	2.50 U	5 U	2.50 U	2.5 U	2.50 U	2.50 U
Barium	-	-	30.8	50 U	25.0 U	25.0 U	50 U	25.0 U	25 U	25.0 U	25.0 U
Beryllium	-	-	1.05	6.34 ☆	3.57 ☆	2.88	3.54	3.61 ☆	0.5 U	2.28	1.52
Cadmium	2.0	0.25	4.69	63.7 ★	29.1 ★	28.7 ★	2.54	30.3 ★	2.73	16.1 ★	13.7
Calcium	-	-	162,000	348,000	230,000	238,000	450,000	258,000	162,000	202,000	182,000
Chromium	-	-	2.56 J	5 U	2.50 U	2.50 U	5 U	2.50 U	2.5 U	2.50 U	2.50 U
Cobalt	-	-	20.6	83.1 ☆	49.2	46.6	136	59.4	7.71	33.0	30.4
Copper	13	9.0	291	4,230 ★	909 ★	884 ★	5 U	796	8.83	398	366
Iron	-	1,000	3,230	52,900 ★	31,400 ★	30,000 ★	131,000	32,500 ★	3,230	16,200 ★	15,900 ★
Lead	65	2.5	9.44	5.93	14.6	19.3	1.52 J	44.8 ★	0.643 J	25.0	27.9
Magnesium	-	-	9,690	24,800	15,600	16,100	31,400	18,200	8,230	13,100	12,600
Manganese	-	-	1,940	23,700 ☆	14,800 ☆	14,800 ☆	43,000	18,500 ☆	1,840	10,100 ☆	9,150 ☆
Molybdenum	-	-	3.63	1 U	0.500 U	0.500 U	1 U	0.500 U	0.535 J	0.500 U	0.500 U
Nickel	470	52	13.6	39.3	328 ★	20.8	46.9	24.8	2.5 U	14.7	12.6
Potassium	-	-	747 J	1,430	899 J	926 J	1,740	987 J	747 J	933 J	1,070
Selenium	-	5.0	2.5 U	5 U	2.50 U	2.50 U	5 U	2.50 U	2.5 U	2.50 U	2.50 U
Silver	180	-	0.843 J	1 U	0.500 U	0.500 U	1 U	0.500 U	0.5 U	0.500 U	0.500 U
Sodium	-	-	3,470	5,140	4,820	5,100	9,500	5,630	3,470	4,480	4,370
Thallium	-	-	15.4	5 U	2.50 U	2.50 U	5 U	2.50 U	2.5 U	2.50 U	2.50 U
Vanadium	260	-	5.0 U	10 U	5.00 U	5.00 U	10 U	5.00 U	5 U	5.00 U	5.00 U
Zinc	120	120	924	16,200 ★	9,350 ★	9,230 ★	18,800	10,700 ★	647	5,510 ★	5,130 ★

000066

TABLE 6, cont.
Surface Water Dissolved Metals Analytical Summary
 Concentrations in micrograms per liter (µg/L) parts per billion (ppb)

Field Sample ID: Location:	Superfund Chemical Data Matrix (SCDM) Environmental Acute (µg/L)	Superfund Chemical Data Matrix (SCDM) Environmental Chronic (µg/L)	Highest Selected Background Value (from Table 5)	UASW056 Cement Creek downstream of the Dry Gulch drainage	UASW054 Prospect Gulch drainage (source)	UASW050 Cement Creek downstream of the Mammoth Tunnel	UASW049 Cement Creek upstream of the confluence with Fairview Gulch and the Elk Tunnel discharge	UASW047 Cement Creek downstream of the Elk Tunnel and Fairview Gulch	UASW046 Cement Creek upstream of the confluence with Minnesota Gulch drainage	UASW045 Minnesota Gulch drainage (1 of 5 backgrounds)	UASW044 Cement Creek upstream of the Anglo Saxon Mine and downstream of Minnesota Gulch drainage
Aluminum	750	87	4,280	5,440	14,400	8,830	8,900	8,450	8,340	4,280	8,150
Antimony	-	-	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U	2.5 U	2.50 U
Arsenic	340	150	2.5 U	2.50 U	17	4.63 J	5.00 J	3.51 J	2.50 U	2.5 U	2.50 U
Barium	-	-	30.8	25.0 U	25 U	25.0 U	25.0 U	25.0 U	25.0 U	29 J	25.0 U
Beryllium	-	-	1.05	1.75	0.726 J	1.50	1.27	1.44	1.52	1.05	1.32
Cadmium	2.0	0.25	4.69	12.7	5.33	9.70	9.51	8.99	8.60	3.79	9.09
Calcium	-	-	162,000	178,000	35,400	169,000	171,000	170,000	170,000	52,700	167,000
Chromium	-	-	2.56 J	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U	2.5 U	2.50 U
Cobalt	-	-	20.6	30.4	26.1	28.7	29.8	29.4	28.2	20.6	28.9
Copper	13	9.0	291	355	190	235	239	225	212	150	212
Iron	-	1,000	3,230	16,000 ★	27,600	23,900 ★	24,100 ★	21,800 ★	20,000 ★	2.68	18,200 ★
Lead	65	2.5	9.44	26.8	57.3	25.3	25.4	24.7	24.8	9.44	26.0
Magnesium	-	-	9,690	12,200	7,560	11,700	11,800	11,400	11,300	9,690	11,200
Manganese	-	-	1,940	8,750 ☆	826	6,240 ☆	6,180 ☆	5,860 ☆	5,780	1,620	5,750
Molybdenum	-	-	3.63	0.500 U	0.5 U	0.500 U	0.500 U	0.500 U	0.500 U	0.5 U	0.500 U
Nickel	470	52	13.6	12.2	19.6	15.2	15.3	14.4	13.2	13.6	14.9
Potassium	-	-	747 J	1,100	2,130	1,700	1,720	1,680	1,660	714 J	1,650
Selenium	-	5.0	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U	2.5 U	2.50 U
Silver	180	-	0.843 J	0.500 U	0.5 U	0.500 U	0.500 U	0.500 U	0.500 U	0.5 U	0.500 U
Sodium	-	-	3,470	4,280	1,230	3,810	3,870	3,990	4,030	1,620	4,030
Thallium	-	-	15.4	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U	2.5 U	2.50 U
Vanadium	260	-	5.0 U	5.00 U	5 U	5.00 U	5.00 U	5.00 U	5.00 U	5 U	5.00 U
Zinc	120	120	924	4,850 ★	1,350	3,560 ★	3,510 ★	3,320 ★	3,230 ★	907	3,210 ★

TABLE 6, cont.
Surface Water Dissolved Metals Analytical Summary
 Concentrations in micrograms per liter (µg/L) parts per billion (ppb)

Field Sample ID: Location:	Superfund Chemical Data Matrix (SCDM) Environmental Acute (µg/L)	Superfund Chemical Data Matrix (SCDM) Environmental Chronic (µg/L)	Highest Selected Background Value (from Table 5)	UASW043 Anglo Saxon Mine drainage (source)	UASW042 Cement Creek downstream of the Anglo Saxon Mine drainage	UASW041 Cement Creek upstream of the confluence with Ohio Gulch drainage	UASW040 Ohio Gulch drainage (source)	UASW039 Cement Creek upstream of the Illinois Gulch drainage and downstream of Ohio Gulch drainage	UASW037 Cement Creek downstream of the Illinois Gulch drainage	UASW036 Cement Creek upstream of the Kendrick-Gelder Smelter	UASW035 (CCS*) Cement Creek downstream of the Kendrick-Gelder Smelter
Aluminum	750	87	4,280	225	7,870	8,090	17,100	8,320	7,580	7,800	7,890
Antimony	-	-	2.5 U	5 U	2.50 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U
Arsenic	340	150	2.5 U	5 U	2.50 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U
Barium	-	-	30.8	50 U	25.0 U	25.0 U	25 U	25.0 U	25.0 U	25.0 U	25.0 U
Beryllium	-	-	1.05	1.31 J	1.36	1.58	1.72	0.925 J	0.986 J	0.910 J	1.14
Cadmium	2.0	0.25	4.69	2.1	8.14	8.71	4.41	7.47	7.38	5.87	6.57
Calcium	-	-	162,000	304,000	175,000	171,000	57,800	165,000	172,000	171,000	177,000
Chromium	-	-	2.56 J	5 U	2.50 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U
Cobalt	-	-	20.6	34.9	25.6	26.7	59.1	27.3	24.7	23.5	22.3
Copper	13	9.0	291	5 U	191	184	229	184	175	146	147
Iron	-	1,000	3,230	19,300	17,100 ★	17,200 ★	32,700	17,600 ★	14,800 ★	12,200 ★	12,000 ★
Lead	65	2.5	9.44	1 U	24.1	24.5	95.6	25.7	22.4	18.9	17.4
Magnesium	-	-	9,690	18,900	11,600	11,300	12,600	11,300	10,900	10,600	10,900
Manganese	-	-	1,940	8,020	5,900 ★	5,710	5,010	5,610	5,280	4,390	4,580
Molybdenum	-	-	3.63	1 U	0.500 U	0.500 U	0.5 U	0.500 U	0.557 J	0.900 U	0.500 U
Nickel	470	52	13.6	5 U	12.2	12.9	33.2	12.7	11.5	11.7	11.0
Potassium	-	-	747 J	2,450	1,650	1,680	1,300	1,680	1,580	1,780	1,840
Selenium	-	5.0	2.5 U	5 U	2.50 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U
Silver	180	-	0.843 J	1 U	0.500 U	0.500 U	0.5 U	0.500 U	0.500 U	0.891 J	0.500 U
Sodium	-	-	3,470	9,620	4,280	4,150	2,180	4,090	4,310	4,460	4,550
Thallium	-	-	15.4	5 U	2.50 U	2.50 U	2.5 U	2.77 J	4.02 J	6.35	2.50 U
Vanadium	260	-	5.0 U	10 U	5.00 U	5.00 U	5 U	5.00 U	5.00 U	5.00 U	5.00 U
Zinc	120	120	924	2,450	3,160 ★	3,090 ★	1,070	3,000 ★	2,800 ★	2,260	2,340

000068

TABLE 6, cont.
 Surface Water Dissolved Metals Analytical Summary
 Concentrations in micrograms per liter (µg/L) parts per billion (ppb)

Field Sample ID: Location: Analytes	Superfund Chemical Data Matrix (SCDM) Environmental Acute (µg/L)	Superfund Chemical Data Matrix (SCDM) Environmental Chronic (µg/L)	Highest Selected Background Value (from Table 5)	UASW02 Cement Creek immediately upstream of the confluence with the Animas River	UASW003 (A68) Animas River upstream of confluence with Cement Creek (1 of 5 backgrounds)	UASW01 Animas River downstream of confluence with Cement Creek	UASW34 Animas River upstream of confluence with Mineral Creek	UASW033 (M34) Mineral Creek upstream of confluence with the Animas river (source)	UASW32 Animas River downstream of confluence with Mineral Creek	UASW29 (A72) Animas River most downstream sample location
Aluminum	750	87	4,280	7,810	86.2	7,330	530	381	275	1,300
Antimony	-	-	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Arsenic	340	150	2.5 U	2.50 U	2.5 U	2.50 U	2.50 U	2.50 U	2.50 U	2.50 U
Barium	-	-	30.8	25.0 U	25 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U
Beryllium	-	-	1.05	0.826 J	0.5 U	1.17	0.5 U	0.5 U	0.5 U	0.5 U
Cadmium	2.0	0.25	4.69	6.55	1.82	6.19	2.96	0.926 J	1.76	0.653 J
Calcium	-	-	162,000	175,000	54,300	169,000	91,000	57,500	76,900	87,500
Chromium	-	-	2.56 J	2.5 U	2.5 U	2.50 U	2.5 U	2.5 U	2.50 U	2.50 U
Cobalt	-	-	20.6	23.7	0.5 U	20.4	7.33	3.75	6.34	3.84
Copper	13	9.0	291	148	2.5 U	121	26.1	2.5 U	13.9	2.50 U
Iron	-	1,000	3,230	11,500 ★	100 U	10,800 ★	1,980	2,800	2,630	8,140
Lead	65	2.5	9.44	17.8	0.79 J	17.8	0.5 U	1.23	0.5 U	8.74
Magnesium	-	-	9,690	10,900	3,290	10,400	5,630	4,860	5,720	7,330
Manganese	-	-	1,940	4,650	1,940	4,760	2,560	327	1,270	796
Molybdenum	-	-	3.63	1.04 J	3.63	0.500 U	0.67 J	0.5 U	0.500U	0.500 U
Nickel	470	52	13.6	10.6	2.5 U	8.46	2.96 J	2.5 U	2.50 U	2.50 U
Potassium	-	-	747 J	1,790	614 J	1,700	1,010	629 J	856 J	1,620
Selenium	-	5.0	2.5 U	2.50	2.5 U	2.50 U	2.50 U	2.5 U	2.50 U	2.5 U
Silver	180	-	0.843 J	0.953 J	0.843 J	0.5 U	0.500 U	0.5 U	0.500 U	0.500 U
Sodium	-	-	3,470	4,540	2,460	4,450	3,150	3,300	3,570	5,580
Thallium	-	-	15.4	5.61	15.4	2.50 U	2.50 U	2.5 U	2.50 U	2.50 U
Vanadium	260	-	5.0 U	5.00 U	5 U	5.00 U	5.00 U	5 U	5.00 U	5.00 U
Zinc	120	120	924	2,370	449	2,410	1,030	185	558	94.6

J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the analyte is reliable.
 U The analyte was not detected above the CRQL.
 µg/L micrograms per liter
 BOLD Background value
 ☆ Elevated Concentration (concentration is > 3X background, but not > than a benchmark)
 ★ Elevated Concentration (concentration is > 3X background and > than a benchmark)

Sources: EPA 2008 (CLP limits); EPA 2004 (SCDM); EPA 2008 (Low Concentration Detection Limits)

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TABLE 7
Highest Background Analyte Value for Total Metals Selected from five Sediment Background Locations
mg/kg (ppm)

Field Sample ID: Location:	Highest Selected Background Value	UASE003 (A68) Animas River upstream of confluence with Cement Creek	UASE005 (CC17) South Fork of Cement Creek	UASE012 North Fork of Cement Creek upstream of the Gold King 7 Level Mine	UASE030 (CC01F) Lower Ross Basin Drainage upstream of Grand Mogul Mine	UASE045 Minnesota Gulch Drainage
Aluminum	15,700	8,570	8,370	10,900	15,700	10,400
Antimony	1.4 UJ	1.3 UJ	1.3 UJ	1.3 UJ	1.2 U	1.4 UJ
Arsenic	(81.6)	5.9 J (10.3)	11.6 J (20.2)	17.3 J (30.1)	31.5 J+	46.9 J (81.6)
Barium	(1253)	108 J (430.9)	78.8	102	94.2 J+	314 J (1253)
Beryllium	1.4 J+	1 J+	0.66 J+	0.63 U	1.4 J+	0.96 J+
Cadmium	(14.7)	5.8 J (8.2)	0.64 UJ	0.63 U	10.4 J (14.7)	0.68 U
Calcium	2,560	2,560	1,230	1,890	1,990	1,350
Chromium	8	6.5	6.2 J (8.0)	8	8	7.8
Cobalt	20.5	10.9 J (13.6)	6.5	10.4	20.5	14.8 J (18.5)
Copper	1,240 J+	119 J (145.2)	65 J (79.3)	73.1	1,240 J+	77.1 J (94.1)
Iron	71,200	20,800	34,800	37,100	71,200	37,000
Lead	(2131)	612	145	532 J (766)	1,480 J (2131)	342
Magnesium	11,500	5,610	1,460	5,380	11,500	3,850
Manganese	6,750	6,750	839 J (1040)	675	6,600	1,560
Nickel	15.8	8.2 J (11.1)	4.2 J (5.67)	7.1	11.7 J (15.8)	7.5 J (10.1)
Potassium	1,310 J+	745 J+	902 J+	1,000 J+	642 J+	1,310 J+
Selenium	(2.6)	0.099 J (0.24)	3.2 UJ	3.1 UJ	3 U	1.1 J (2.6)
Silver	(2.09)	1.5 J+	0.64 UJ	1.3 J+	1.2 J (2.09)	1.5 J+
Sodium	99.3 J+	641 U	640 U	99.3 J+	600 UJ	684 U
Thallium	(0.82)	0.64 U	0.64 UJ	0.35 J+	0.44 J- (0.82)	0.75 J+
Vanadium	52.2	30.6	52.2	49	40.9	48.6
Zinc	(2,250)	1,470 J (2,205)	145 J- (217.5)	73.8 J (110.7)	1,500 J (2,250)	144 J (216)

J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the analyte is reliable.
 J- The associated numerical value is an estimated quantity but the result may be biased low.
 J+ The associated numerical value is an estimated quantity, but the result may be biased high.
 U The analyte was not detected above the CRQL.
 UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element may not be present the sample.
 mg/kg milligrams/kilogram
 BOLD Background value
 (X.X) Corrected Value as per EPA 540-F-94-028 "Using Qualified Data to Document an Observed Release and Observed Contamination".

000070

TABLE 8
Sediment Sample Results - Total Metals
mg/kg (ppm)

Sample ID: Location:	Highest Selected Background Value (see Table 7)	UASE001 Animas River downstream of the confluence with Cement Creek	UASE002 Cement Creek immediately upstream of the confluence with the Animas River	UASE003 Animas River upstream of confluence with Cement Creek (1 of 5 backgrounds)	UASE004 Cement Creek downstream of the confluence with the South Fork of Cement Creek	USSE005 South Fork of Cement Creek (1 of 5 backgrounds)	UASE006 Cement Creek downstream of the American Tunnel and upstream of the confluence with the South Fork of Cement Creek	UASE007 Discharge from the American Tunnel immediately above confluence with Cement Creek (source)	UASE008 Cement Creek upstream of the American Tunnel
Aluminum	15,700	6,860	7,030	8,570	9,570	8,370	7,030	13,400	13,700
Antimony	1.4 UJ	2.1 UJ	1.4 UJ	1.3 UJ	1.3 UJ	1.3 UJ	2.8 J (1.4)	5 UJ	1.7 UJ
Arsenic	(81.6)	45.3 J (26.0)	34.1 J (19.6)	5.9 J (10.3)	20.3 J (11.7)	11.6 J (20.2)	50.2 J (28.9)	17.7 J	33.3 J (19.1)
Barium	(1253)	559 J (140)	210 J (52.6)	108 J (430.9)	97.3	78.8	146	24.9 UJ	92.7
Beryllium	1.4 J+	1 UJ	0.72 U	1 J+	0.65 U	0.66 J+	0.95 U	2.5 U	1.1 J+ (0.86)
Cadmium	(14.7)	1 UJ	0.72 U	5.8 J (8.2)	0.9	0.64 UJ	2.9	2.5 U	1.3 J (0.92)
Calcium	2,560	1,100	1,010	2,560	1,530	1,230	1,420	2,490 U	1,660
Chromium	8	6.6	6.4	6.5	7	6.2 J (8.0)	8.4	5 U	7.6 J (5.9)
Cobalt	20.5	3.9 J (2.9)	4.3 J (3.4)	10.9 J (13.6)	11.8	6.5	3.9	2.5 U	16.5
Copper	1,240 J+	48.7 J (39.9)	53 J (43.4)	119 J (145.2)	86.5	65 J (79.3)	279	28.1	209 J (171)
Iron	71,200	78,100	68,800	20,800	57,600	34,800	114,000	238,000 ☆	37,300
Lead	(2131)	459	322	612	726 J (504)	145	5,720 J (3972)	217 J	711
Magnesium	11,500	3,030	4,080	5,610	6,070	1,460	3,810	913	8,730
Manganese	6,750	333	506	6,750	1,530	839 J (1040)	1,340	336	4,130 J 3,331)
Nickel	15.8	3.4 J (2.5)	4 J	8.2 J (11.1)	4.4	4.2 J (5.67)	3.8	1.3	8 J (5.9)
Potassium	1,310 J+	1,700 J+ (97.2)	889 J+ (50.8)	745 J+ (42.6)	751 J+ (42.9)	902 J+	1,560 J+ (89.2)	231 J+	825 U
Selenium	(2.6)	1.6 J (0.67)	0.81 J (0.34)	0.099 J (0.24)	3.3 UJ	3.2 UJ	4.8 UJ	12.4 UJ	4.1 UJ
Silver	(2.09)	4.5 J+ (2.6)	2.5 J+ (1.4)	1.5 J+	1.7 J+ (0.97)	0.64 UJ	12.1 J+ (6.95) ☆	2.5 UJ	2.1 J (1.2)
Sodium	99.3 J+	1,040 U	723 U	641 U	62.3 J+ (2.45)	640 U	118 J+ (4.64)	44.5 J+	825 U
Thallium	(0.82)	1 U	0.72 U	0.64 U	0.39 J+ (0.21)	0.64 UJ	0.6 J+ (0.32)	2.5 UJ	0.83 UJ
Vanadium	52.2	49.7	44.8	30.6	47.3	52.2	47.7	41.8	64.1
Zinc	(2,250)	205 J (137)	199 J (133)	1,470 J (2,205)	261 J (174)	145 J- (217.5)	815 J (543)	269 J	289 J-

J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the analyte is reliable.
 J- The associated numerical value is an estimated quantity but the result may be biased low.
 J+ The associated numerical value is an estimated quantity, but the result may be biased high.
 U The analyte was not detected above the CRQL.
 UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element may not be present the sample.
 mg/kg milligrams/kilogram
 BOLD Background value
 (X.X) Corrected Value as per EPA 540-F-94-028 "Using Qualified Data to Document an Observed Release and Observed Contamination".
 ☆ Concentration elevated 3X background

000071

TABLE 8, cont.
Sediment Sample Results-Total Metals
mg/kg (ppm)

Sample ID: Location:	Highest Selected Background Value (see Table 7)	UASE009 Cement Creek downstream of the confluence with the North Fork of Cement Creek	UASE010 North Fork of Cement Creek upstream of the confluence with Cement Creek	UASE011 North Fork of Cement Creek downstream of the Gold King 7 Level Mine - at road crossing	UASE012 North Fork of Cement Creek upstream of the Gold King 7 Level Mine (1 of 5 backgrounds)	UASE013 Cement Creek upstream of the confluence with the North Fork of Cement Creek	UASE014 Cement Creek downstream of Red and Bonita Mine	UASE015 Drainage channel adjacent to county road below Red and Bonita (source)	UASE016 Cement Creek upstream of Red and Bonita Mine
Aluminum	15,700	4,940	9,330	2,020	10,900	4,520	3,850	4,670	8,140
Antimony	1.4 UJ	2.7 UJ	1.3 UJ	2.8 UJ	1.3 UJ	2.8 UJ	3 UJ	2.3 J	3.2 UJ
Arsenic	(81.6)	15.2 J (8.7)	26.2 J (15.1)	36.7 J (21.1)	17.3 J (30.1)	20.5 J (11.8)	24.5 J (14.1)	23.2 J	57.5 J (33.0)
Barium	(1253)	71.6	51.8	30.7	102	61.9	36.1	46.5	200
Beryllium	1.4 J+	1.4 UJ	0.64 UJ	1.4 UJ	0.63 U	1.4 UJ	1.5 UJ	1.1 UJ	1.6 UJ
Cadmium	(14.7)	1.4 UJ	0.64 UJ	0.11	0.63 U	1.4 UJ	1.5 UJ	2.4 J	1.6 UJ
Calcium	2,560	1,370 U	1,710	1,380 U	1,890	1,410 U	1,500 U	1,130	1,940
Chromium	8	6.4 J (5.0)	9.1 J (7.1)	5.1 J (4.0)	8	4.3 J (3.3)	6.1 J (4.7)	4 J	11.9 J (9.2)
Cobalt	20.5	6.8	4.3	2.8 U	10.4	6	3 U	2.2 U	23.7
Copper	1,240 J+	124 J (101.6)	42.8 J (35.1)	113 J (92.6)	73.1	84 J (68.9)	147 J (120.5)	112 J	250 J (205)
Iron	71,200	159,000	18,200	397,000 ☆	37,100	203,000	218,000 ☆	442,000	65,400
Lead	(2131)	341	294	136	532 J (766)	362	773	457	1,460
Magnesium	11,500	1,370 U	8,680	1,380 U	5,380	1,410 U	1,500 U	1,120 U	2,260
Manganese	6,750	2,010 J (1,621)	624 J (503)	156 J (126)	675	1,910 J (1537)	489 J (394)	239 J	2,360 J (1,903)
Nickel	15.8	2.2 J (1.6)	4.1 J (3.0)	1.4 UJ	7.1	1.6 J (1.2)	2 J (1.5)	1.1 UJ	12.3 J (9.1)
Potassium	1,310 J+	1,370 U	638 U	1,380 U	1,000 J+	1,410 U	1,500 U	1,120 U	1,580 U
Selenium	(2.6)	6.9 UJ	3.2 UJ	6.9 UJ	3.1 UJ	7.1 UJ	7.5 UJ	5.6 UJ	7.9 UJ
Silver	(2.09)	4 J (2.3)	0.88 J (0.51)	1.4 UJ	1.3 J+	2.3 J (1.32)	8.5 J (4.9)	3.9 J	1.6 UJ
Sodium	99.3 J+	1,370 U	638 U	1,380 U	99.3 J+	1,410 U	1,500 U	1,120 U	1,580 U
Thallium	(0.82)	1.4 UJ	0.64 UJ	1.4 UJ	0.35 J+	1.4 UJ	1.5 UJ	1.1 UJ	1.6 UJ
Vanadium	52.2	27.3	29.1	27.8	49	29.7	34	31.7	62
Zinc	(2,250)	242 J-	145 J-	44.1 J-	73.8 J (110.7)	240 J-	465 J-	1,040 J-	378 J-

J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the analyte is reliable.
 J- The associated numerical value is an estimated quantity but the result may be biased low.
 J+ The associated numerical value is an estimated quantity, but the result may be biased high.
 U The analyte was not detected above the CRQL.
 UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element may not be present the sample.
 mg/kg milligrams/kilogram
 BOLD Background value
 (X.X) Corrected Value as per EPA 540-F-94-028 "Using Qualified Data to Document an Observed Release and Observed Contamination".
 ☆ Concentration elevated 3X background

000072

TABLE 8, cont.
 Sediment Sample Results - Total Metals
 mg/kg (ppm)

Sample ID: Location:	Highest Selected Background Value (see Table 7)	UASE017 Cement Creek downstream of wetland that channels Mogul Mine drainage	UASE018 Cement Creek upstream of wetland that contains Mogul Mine drainage	UASE019 Mogul Mine drainage (in wetland) (source)	UASE020 Cement Creek upstream of Mogul Mine	UASE021 Cement Creek downstream of Mogul North Mine	UASE022 Mogul North Mine discharge (source)	UASE023 Cement Creek upstream of Mogul North Mine and downstream of confluence with Lower Ross	UASE024 Cement Creek downstream of Queen Anne Mine and upstream of confluence with Lower Ross (source)
Aluminum	15,700	8,100	13,100	5,960	12,200	13,600	6,720	3,020	11,500
Antimony	1.4 UJ	1.3 UJ	1.3 UJ	1.6 UJ	1.4 UJ	1.3 U	6.8 U	1.7 J (0.9)	1.7 U
Arsenic	(81.6)	17.7 J (10.2)	28.1 J (16.1)	62.5 J	36.8 J (21.1)	25.8 J+ (14.8)	42.6 J+	45.6 J+ (26.2)	49.4 J+
Barium	(1253)	121	90.8	121	147	74.3 J+ (18.6)	119 J+	264 J+ (66.2)	205 J+
Beryllium	1.4 J+	0.63 U	0.73 J+ (0.57)	0.8 U	1.4 J+ (1.1)	1.3 J+ (1.02)	3.4 UJ	1.3 J+ (1.02)	1.3 J+
Cadmium	(14.7)	0.63 U	2	1.4	7.4	6 J (4.3)	3.4 UJ	6 J (4.3)	7 J
Calcium	2,560	1,740	2,020	804 U	1,110	1,310	3,380 U	718 U	1,280
Chromium	8	6.9	9	8.5	9.6	7.1	19.7	6.2	8.2
Cobalt	20.5	13.2	11.2	5.4	12.9	12.3	4.8	15.3	15.8
Copper	1,240 J+	63.6	193	177	546	516 J+ (423)	303 J+	424 J+ (348)	294 J+
Iron	71,200	38,100	35,000	116,000	31,900	37,200	141,000	5,150	27,100
Lead	(2131)	379 J (263)	543 J (377)	546 J	779 J (541)	481 J (334)	668 J	2,030 J (1409)	754 J
Magnesium	11,500	5,830	8,970	3,260	5,340	7,200	3,380 U	1,090	5,670
Manganese	6,750	1,420	3,650	1,130	5,130	4,710	1,180	7,960	11,500
Nickel	15.8	6.3	5.2	4.5	6.9	10.3 J	5.9 J	7.7 J (5.7)	7.8 J
Potassium	1,310 J+	440 J+ (25.1)	501 J+ (28.6)	842 J+	648 J+ (37.0)	664 U	3,380 U	718 U	1,210 J+
Selenium	(2.6)	3.1 UJ	3.3 UJ	4 UJ	3.5 UJ	3.3 U	17 U	3.6 U	4.3 U
Silver	(2.09)	1.3 J+ (0.75)	1.7 J+ (0.97)	5.1 J+	2.8 J+ (1.61)	2 J (1.15)	27.1 J	11.8 J ☆	4 J
Sodium	99.3 J+	30.8 J+ (1.2)	21.9 J+ (0.86)	65.3 J+	29.5 J+ (1.16)	664 UJ	3,380 U	718 UJ	855 UJ
Thallium	(0.82)	0.3 J+ (0.16)	0.4 J+ (0.22)	0.3 J+	0.4 J+ (0.22)	0.41 J- (0.22)	0.31 J-	0.77	0.88
Vanadium	52.2	46.3	32.2	42.6	33.2	32.5	20.8	27.8	38
Zinc	(2,250)	184 J (123)	332 J (221)	444 J	1,990 J (1327)	651 J (434)	350 J	614 J (409)	899 J

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 mg/kg milligrams/kilogram
 BOLD Background value
 (X.X) Corrected Value as per EPA 540-F-94-028 "Using Qualified Data to Document an Observed Release and Observed Contamination".
 ☆ Concentration elevated 3X background

000073

TABLE 8, cont.
 Sediment Sample Results - Total Metals
 mg/kg (ppm)

Sample ID: Location:	Highest Selected Background Value (see Table 7)	UASE029 Animas River Below Silverton	UASE030 Lower Ross Basin Drainage upstream of Grand Mogul Mine (1 of 5 backgrounds)	UASE032 Animas River downstream of the confluence with Mineral Creek	UASE033 Mineral Creek upstream of the confluence with the Animas River (source)	UASE034 Animas River upstream of the confluence with Mineral Creek	UASE035 Cement Creek downstream of the Kendrick-Gelder Smelter	UASE036 Cement Creek upstream of the Kendrick-Gelder Smelter	UASE037 Cement Creek downstream of the Illinois Gulch drainage
Aluminum	15,700	12,300	15,700	8,000	28,200	11,600	5,900	7,040	4,890
Antimony	1.4 UJ	1.6 UJ	1.2 U	1.3 UJ	3.5 UJ	1.7 UJ	1.6 UJ	1.4 UJ	1.6 UJ
Arsenic	(81.6)	27.3 J (15.7)	31.5 J+	14.2 J (8.2)	26.7 J	13.3 J (7.6)	41.7 J (24.0)	35.3 J (20.3)	57 J (32.8)
Barium	(1253)	261 J (65.4)	94.2 J+	79.3 J (19.9)	159	123 J (30.8)	424 J (108)	342 J (85.7)	317 J (79.4)
Beryllium	1.4 J+	0.89 J+ (0.69)	1.4 J+	0.75 J+ (0.59)	1.7 UJ	0.87 U	0.78 U	0.68 U	0.82 U
Cadmium	(14.7)	2 J (1.4)	10.4 J (14.7)	0.97 J (0.69)	1.7 UJ	0.87 U	0.83 J (0.59)	1.4 J (1.0)	0.82 U
Calcium	2,560	2,010	1,990	2,050	1,950	1,810	934	1,040	822 U
Chromium	8	5.6	8	6.9	5.1 J	4.7	5.2	5.7	4.8
Cobalt	20.5	12.3 J (9.8)	20.5	11 J (8.8)	18.6	5.4 J (4.3)	3.8 J (3.0)	4.8 J (3.8)	3.6 (2.9)
Copper	1,240 J+	167 J (137)	1,240 J+	201 J 165	216 J	91.4 J (74.9)	42.7 J (35)	98.6 J (80.8)	41.8 (34.3)
Iron	71,200	58,100	71,200	26,000	62,200	44,300	71,700	62,200	88,900
Lead	(2131)	734	1,480 J (2,131)	187	210	366	394	306	541
Magnesium	11,500	4,270	11,500	3,730	2,280	6,090	2,440	3,760	2,180
Manganese	6,750	2,710	6,600	1,160	897 J	1,440	421	580	436
Nickel	15.8	5.2 J (3.9)	11.7 J (15.8)	5.9 J (4.4)	6 J	3.9 J (2.9)	3.1 J (2.5)	3.4 J (2.5)	3.2 J (2.4)
Potassium	1,310 J+	1,260 J+ (72)	642 J+	674 U	1,740 U	865 U	1,300 J+ (74)	1,090 J+ (61)	1,200 J+ (69)
Selenium	(2.6)	0.52 J (0.22)	3 U	0.45 J (0.19)	8.7 UJ	0.51 J (0.21)	1.5 J (0.64)	1 J (0.42)	1.4 J (0.6)
Silver	(2.09)	2.8 J+ (1.6)	1.2 J (2.1)	0.67 U	1.7 UJ	1.2 J+ (0.7)	2.4 J+ (1.4)	1.4 J+ (0.8)	2.1 J+ (1.2)
Sodium	99.3 J+	814 U	600 UJ	674 U	1,740 U	865 U	781 U	676 U	822 U
Thallium	(0.82)	0.81 U	0.44 J- (0.82)	0.67 U	1.7 UJ	0.87 U	0.78 U	0.68 U	0.82 U
Vanadium	52.2	41.1	40.9	36.1	31.3	25.8	40.7	42.3	48.6
Zinc	(2,250)	447 J (298)	1,500 J (2,250)	289 J (161)	339 J-	241 J (161)	197 J (131)	360 J (240)	153 J (102)

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 mg/kg milligrams/kilogram
 BOLD Background value
 (X.X) Corrected Value as per EPA 540-F-94-028 "Using Qualified Data to Document an Observed Release and Observed Contamination".
 ★ Concentration elevated 3X background

000074

TABLE 8, cont.
 Sediment Sample Results - Total Metals
 mg/kg (ppm)

Sample ID: Location:	Highest Selected Background Value (see Table 7)	UASE039 Cement Creek upstream of the confluence with Illinois Gulch drainage and downstream of Ohio Gulch drainage	UASE040 Ohio Gulch drainage (source)	UASE041 Cement Creek upstream of the confluence with Ohio Gulch drainage	UASE042 Cement Creek downstream of the Anglo Saxon Mine drainage	UASE043 Anglo Saxon Mine drainage (source)	UASE044 Cement Creek upstream of the Anglo Saxon Mine and downstream of Minnesota Gulch drainage	UASE045 Minnesota Gulch drainage (1 of 5 backgrounds)	UASE046 Cement Creek upstream of the confluence with Minnesota Gulch drainage
Aluminum	15,700	5,540	5,240	8,220	5,710	5,060	8,860	10,400	5,070
Antimony	1.4 UJ	1.4 UJ	1.3 UJ	1.5 UJ	1.9 UJ	2.5 UJ	1.3 UJ	1.4 UJ	3.8 UJ
Arsenic	(81.6)	34 J (919.5)	54.8 J	34.3 J (19.7)	37.2 J (21.4)	103 J	34 J (19.5)	46.9 J (81.6)	115 J (66.1)
Barium	(1253)	422 J (106)	582 J ☆	121 J (30.3)	258 J (65)	36.3 J	191 J (48)	314 J (1253)	80.6 J (20)
Beryllium	1.4 J+	0.71 U	0.64 U	0.74 U	0.93 U	10.3 J+	0.66 U	0.96 J+	1.9 U
Cadmium	(14.7)	0.71 U	2.6 J	0.51	0.93 U	4.1 J	2 J (1.4)	0.68 U	1.9 U
Calcium	2,560	735	644 U	1,040	1,040	4,130	2,020	1,350	1,900 U
Chromium	8	5.9	4.5	6.6	8.4	2.5 U	7	7.8	6.2
Cobalt	20.5	3.1 J (2.5)	4 J	5.5 J (4.4)	4.4 J (3.5)	17 J	5.5 J (4.4)	14.8 J (18.5)	2.1 J (1.7)
Copper	1,240 J+	29.8 J ((24.4)	40.4 J	55.2 J (45.2)	59.7 J (48.9)	110 J	76.4 J (62.6)	77.1 J (94.1)	112 J (91.8)
Iron	71,200	56,500	44,400	94,600	123,000	860,000	67,200	37,000	341,000 ☆
Lead	(2131)	361	598	334	417	255	361	342	1,700
Magnesium	11,500	2,810	2,570	4,550	2,360	1,240 U	5,080	3,850	2,130
Manganese	6,750	311	304	831	636	2,410	804	1,560	540
Nickel	15.8	2.8 J (2.1)	3.3 J	3.9 J (2.9)	3.6 J (2.7)	3.3 J	3.6 J (2.7)	7.5 J (10.1)	2.3 J (1.7)
Potassium	1,310 J+	1,270 J+ (73)	1,230 J+	1,060 J+ (61)	1,410 J+ (81)	1,240 U	933 J+ (53)	1,310 J+	1,900 U
Selenium	(2.6)	1.3 J (0.5)	2 J	0.81 J (0.34)	2.1 J (0.9)	0.21 J	1.1 J (0.5)	1.1 J (2.6)	0.63 J (0.26)
Silver	(2.09)	1.9 J+ (1.1)	3.6 J+ ☆	1.4 J+ (0.8)	2.2 J+ (1.3)	1.2 U	1.4 J+ (0.6)	1.5 J+	4.1 J+ (1.7)
Sodium	99.3 J+	714 U	644 U	741 U	926 U	1,240 U	657 U	684 U	1,900 U
Thallium	(0.82)	0.71 U	0.64 U	0.74 U	0.99 J+ (0.53)	1.2 U	0.66 U	0.75 J+	1.9 U
Vanadium	52.2	34.6	36.4	49.9	71.7	13.4	45.2	48.6	96.9
Zinc	(2,250)	136 J (91)	604 J	186 J (126)	225 J (150)	2,470 J	478 J (319)	144 J (216)	177 J (118)

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 mg/kg milligrams/kilogram
 BOLD Background value
 (XX) Corrected Value as per EPA 540-F-94-028 "Using Qualified Data to Document an Observed Release and Observed Contamination".
 ☆ Concentration elevated 3X background

000075

TABLE 8, cont.
 Sediment Sample Results - Total Metals
 mg/kg (ppm)

Sample ID: Location:	Highest Selected Background Value (see Table 7)	UASE047 Cement Creek downstream of the Elk Tunnel and Fairview Gulch	UASE049 Cement Creek upstream of the confluence with Fairview Gulch and the Elk Tunnel discharge and downstream of Georgia Gulch	UASE050 Cement Creek upstream of Georgia Gulch and downstream of the Mammoth Tunnel	UASE054 Prospect Gulch drainage (source)	UASE056 Cement Creek downstream of the Dry Gulch drainage	UASE058 Cement Creek upstream of the confluence with Dry Gulch drainage
Aluminum	15,700	6,160	7,840	6,640	3,730	6,730	5,750
Antimony	1.4 UJ	1.6 UJ	1.3 UJ	1.6 UJ	1.3 UJ	2.2 UJ	2.7 UJ
Arsenic	(81.6)	24.3 J (14)	37.7 J (21.7)	34.7 J (19.9)	58.9 J	20.3 J (11.7)	35.6 J (20.5)
Barium	(1253)	226 J (56.6)	95.5 J (23.9)	250 J (62.7)	144	142	85.9
Beryllium	1.4 J+	0.78 U	0.64 U	0.81 U	0.63 UJ	1.1 UJ	1.4 UJ
Cadmium	(14.7)	0.78 U	17.5 J (12.4)	2.7 J (1.9)	0.77 J	1.1 UJ	2.7 J (1.9)
Calcium	2,560	867	1,120	1,050	627 U	1,100 U	1,370 U
Chromium	8	6.9	7.9	9.9	4.8 J	6.4 J (5.0)	8 J (6.2)
Cobalt	20.5	2.9 J (2.3)	9.3 J (7.4)	6.4 J (5.1)	4	3.2	4.7
Copper	1,240 J+	47.8 J (39.2)	159 J (130)	60 J (49)	64.9 J	80.7 J (66.1)	212 J (174)
Iron	71,200	57,100	33,000	81,600	53,500	144,000	266,000 ☆
Lead	(2131)	304	847	346	254	875	2,050
Magnesium	11,500	2,360	6,800	3,090	2,030	2,820	2,370
Manganese	6,750	407	1,200	1,380	406 J	659 J (531)	1,300 J (1048)
Nickel	15.8	2.8 J (2.1)	7.1 J (5.3)	4.7 J (3.5)	1.9 J	2.9 J (2.1)	2.5 J (1.9)
Potassium	1,310 J+	1,350 J+ (77)	636 U	1,230 J+ (70)	627 U	1,250 J+ (71)	1,370 U
Selenium	(2.6)	2 J (0.8)	0.92 J (0.39)	2	3.1 UJ	5.5 UJ	6.9 UJ
Silver	(2.09)	1.9 J+ (1.1)	2.9 J+ (1.7)	1.7 J+ (1.0)	0.95 J	2.3 J (1.3)	5 J (2.9)
Sodium	99.3 J+	782 U	636 U	813 U	627 U	1,100 U	1,370 U
Thallium	(0.82)	0.8 J+ (0.4)	0.64 U	0.9 J+ (0.5)	0.63 UJ	1.1 UJ	1.4 UJ
Vanadium	52.2	56.3	65.9	72.2	36.5	62	37.2
Zinc	(2,250)	131 J (87)	4,910 J (3273)	693 J (46.2)	192 J-	206 J-	628 J (419)

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 mg/kg milligrams/kilogram
 BOLD Background value
 (X.X) Corrected Value as per EPA 540-F-94-028 "Using Qualified Data to Document an Observed Release and Observed Contamination".
 ☆ Concentration elevated 3X background

TABLE 9
Relative Percent Difference (RPD)

Analyte	UASW005 Surface Water: South Fork of Cement Creek µg/L	UASW098 Duplicate of UASW005 µg/L	RPD	UASE005 Sediment: South Fork of Cement Creek mg/kg	UASE098 Duplicate of UASE005 mg/kg	RPD
Aluminum	720	572	22.9	8,370	5,550	40.5
Antimony	2.5 U	2.5 U	NA	1.3 UJ	1.5 U	NA
Arsenic	2.5 U	2.5 U	NA	11.6 J	11.7 J+	0.9
Barium	25 U	25 U	NA	78.8	190 J+	82.7
Beryllium	0.5 U	0.5 U	NA	0.66 J+	0.76 UJ	14.1
Cadmium	2.73 D	2.41 D	12.5	0.64 UJ	0.76 UJ	17.1
Calcium	162,000	163,000	0.6	1,230	1,500	19.8
Chromium	2.5 U	2.5 U	NA	6.2 J	4.8	25.5
Cobalt	7.71 D	7.36 D	4.6	6.5	4.3	40.7
Copper	8.83 D	6.5 D	30.4	65 J	34.5 J+	61.3
Iron	3,230	3,090	4.4	34,800	30,000	14.8
Lead	0.643 JD	0.5 U	NA	145	72.5 J	66.7
Magnesium	8,230	8,340	1.3	1,460	2,560	54.7
Manganese	1,840	1,860	1.1	839 J	568	38.5
Molybdenum	0.535 JD	0.5 U	NA	--	--	--
Nickel	2.5 U	2.5 U	NA	4.2 J	3.9 J	7.4
Potassium	747 J	752 J	0.7	902 J+	934 J+	3.5
Selenium	2.5 U	2.5 U	NA	3.2 UJ	3.8 U	NA
Silver	0.5 U	0.5 U	NA	0.64 UJ	0.76 UJ	17.1
Sodium	3,470	3,520	1.4	640 U	761 UJ	NA
Thallium	2.5 U	2.5 U	NA	0.64 UJ	0.52	20.7
Vanadium	5 U	5 U	NA	52.2	45.2	14.4
Zinc	647	661	2.1	145 J-	99 J	37.7

TABLE 9, cont.
Relative Percent Difference (RPD)

Analyte	UASW019 Surface Water: Mogul Mine Drainage (in wetland) µg/L	UASW099 Duplicate of UASW019 µg/L	RPD	UASE019 Sediment: South Fork of Cement Creek mg/kg	UASE099 Duplicate of UASE019 mg/kg	RPD
Aluminum	10,100	10,200	1.0	5,960	8,140	30.9
Antimony	2.5 U	2.5 U	NA	1.6 UJ	2 UJ	22.2
Arsenic	2.5 U	2.5 U	NA	62.5 J	86.3 J	32.0
Barium	25 U	25 U	NA	121	168	32.5
Beryllium	3.8 D	3.96 D	4.1	0.8 U	1 U	NA
Cadmium	72.8 D	74.2 D	1.9	1.4	1.2	15.4
Calcium	174,000	174,000	0.0	804 U	1,030 U	NA
Chromium	2.5 U	2.5 U	NA	8.5	9.8	14.2
Cobalt	22.6 D	22.6 D	0.0	5.4	6.1	12.2
Copper	820 D	848 D	3.4	177	251	34.6
Iron	4,460	4,570	2.4	116,000	154,000	28.1
Lead	75.6 D	76.6 D	1.3	546 J	656 J	18.3
Magnesium	13,600	13,700	0.7	3,260	4,670	35.6
Manganese	21,900	22,000	0.5	1,130	1,400	21.3
Molybdenum	0.5 U	0.5 U	NA	--	--	--
Nickel	13.6 D	13.7 D	0.7	4.5	4.8	6.5
Potassium	1,420	1,440	1.4	842 J+	1,120 J+	28.3
Selenium	2.5 U	2.5 U	NA	4 UJ	5.1 UJ	24.2
Silver	0.5 U	0.5 U	NA	5.1 J+	7.5 J+	38.1
Sodium	5,520	5,560	0.7	65.3 J+	98.1 J+	40.1
Thallium	2.5 U	2.5 U	NA	0.3 J+	0.31 J+	3.3
Vanadium	5 U	5 U	NA	42.6	44.3	3.9
Zinc	27,600	27,700	0.4	444 J	464 J	4.4

TABLE 9, cont.
Relative Percent Difference (RPD)

Analyte	UASW035 Surface Water: Mineral Creek downstream of Kendrick-Gelder Smelter µg/L	UASW097 Duplicate of UASW035 µg/L	RPD	UASE035 Sediment: South Fork of Cement Creek mg/kg	UASE097 Duplicate of UASE035 mg/kg	RPD
Aluminum	7,890	7,870	0.3	5,900	4,750	21.6
Antimony	2.5 U	2.5 U	NA	1.6 UJ	1.6 UJ	0.0
Arsenic	2.5 U	2.5 U	NA	41.7 J	44.2 J	5.8
Barium	25 U	25 U	NA	424 J	443	4.4
Beryllium	1.14 D	1.3 D	13.1	0.78 U	0.79 UJ	NA
Cadmium	6.57 D	6.45 D	1.8	0.83 J	0.79 UJ	4.9
Calcium	177,000	175,000	1.1	934	854	8.9
Chromium	2.5 U	2.5 U	NA	5.2	4.6 J	12.2
Cobalt	22.3 D	21.6 D	3.2	3.8 J	3.5	8.2
Copper	147 D	135 D	8.5	42.7 J	35.8 J	17.6
Iron	12,000	11,700	2.5	71,700	73,000	1.8
Lead	17.4 D	19 D	8.8	394	372	5.7
Magnesium	10,900	10,900	0.0	2,440	1,890	25.4
Manganese	4,580	4,810	4.9	421	344 J	20.1
Molybdenum	0.5 U	0.5 U	NA	--	--	--
Nickel	11 D	9.52 D	14.4	3.1 J	2.7 J	13.8
Potassium	1,840	1,800	2.2	1,300 J+	1,150 J+	12.2
Selenium	2.5 U	2.5 U	NA	1.5 J	4 UJ	90.9
Silver	0.5 U	0.5 U	NA	2.4 J+	2.2 J	8.7
Sodium	4,550	4,580	0.7	781 U	795 U	NA
Thallium	2.5 U	2.5 U	NA	0.78 U	0.79 UJ	NA
Vanadium	5 U	5 U	NA	40.7	37.2	9.0
Zinc	2,340	2,500	6.6	197 J	179 J-	9.6

µg/L micrograms per liter
 mg/kg milligrams per kilogram

J The associated numerical value is an estimated quantity because quality control criteria were not met. Presence of the element is reliable.

U The analyte was not detected at or above the CRDL.

UJ The reported quantitation limit is estimated because Quality Control criteria were not met. Element may not be present the sample.

J- The associated numerical value is an estimated quantity but the result may be biased low.

J+ The associated numerical value is an estimated quantity but the result may be biased high.

D The analyte was identified in a sample at a secondary dilution factor.

NA Not applicable

START 3

Superfund Technical Assessment and Response Team 3 –
Region 8



United States
Environmental Protection Agency
Contract No. EP-W-05-050

ANALYTICAL RESULTS REPORT for SITE REASSESSMENT

**UPPER ANIMAS MINING DISTRICT
Silverton, San Juan County, Colorado**

APPENDICES

TDD No. 1008-13

August 10, 2011



URS
OPERATING SERVICES, INC.

In association with:

**TechLaw, Inc.
LT Environmental, Inc.
TN & Associates, Inc.
Garry Struthers Associates, Inc.**

000081

APPENDIX A

Sampling Activities Trip Report (Includes Project Photolog)

URS OPERATING SERVICES

1099 18TH STREET
SUITE 710
DENVER, COLORADO 80202-1908
TEL: (303) 291-8200
FAX: (303) 291-8296

January 10, 2011

Ms. Sabrina Forrest
U.S. Environmental Protection Agency, Region 8
Mail Code: 8EPR-B
1595 Wynkoop Street
Denver, Colorado 80202-1129

**SUBJECT: START 3, EPA Region 8, Contract No. EP-W-05-050, TDD No. 1008-13
Trip Report, Upper Animas Mining District, Silverton, San Juan County, Colorado**

Dear Ms. Forrest:

Attached is one copy of the trip report for sampling activities conducted for the Upper Animas Mining District Site Reassessment. Activities included surface water, sediment, and soil sampling. Field activities were conducted from October 25, 2010 through November 1, 2010. This document is submitted for your approval.

If you have any questions, please call me at 303-291-8264.

Sincerely,

URS OPERATING SERVICES, INC.

Megan Dudevoir
Project Manager

cc: Charles W. Baker/UOS (w/o attachment)
File/UOS

EPA ACTION BLOCK	
<input type="radio"/>	Approved
<input type="radio"/>	Approved, TDD to follow
<input type="radio"/>	Approved as corrected
<input type="radio"/>	Disapproved
<input type="radio"/>	Review with _____
<input type="radio"/>	Original to _____
<input type="radio"/>	Copy to _____
<input type="radio"/>	Reply envelope enclosed
<hr style="border: none; border-top: 1px solid black;"/> Date By _____	

TRIP REPORT
Upper Animas Mining District
Silverton, San Juan County, Colorado

1.0 INTRODUCTION

URS Operating Services, Inc. (UOS), was tasked by the Environmental Protection Agency (EPA), under the Superfund Technical Assessment and Response Team 3 (START) contract # EP-W-05-050 Technical Direction Document (TDD) No. 1008-13, to conduct a site reassessment (SR) at the Upper Animas Mining District site. Specifically, START was tasked to collect as many as 69 surface water samples, 61 sediment samples, and 36 source soil samples, including QA/QC samples. Field activities were completed in accordance with the approved Field Sampling Plan (FSP) (UOS 2010). During the field sampling event 54 surface water samples, 54 sediment samples, and 14 source soil samples were collected; these sample numbers include field duplicate samples.

The site is located in Silverton, San Juan County, Colorado and is made up of publically and privately owned parcels. The investigation focused on the Animas River between U.S. Geological Survey (USGS) gauging stations A72 and A68, Mineral Creek immediately upstream of the Animas River, Cement Creek, and tributaries to Cement Creek (Figure 1) (UOS 2010).

Site activities were conducted from October 25, 2010 through November 1, 2010 and included sample collection along with photo documentation, GPS documentation, and in situ water parameter collection. All water samples were submitted to the EPA Region 8 Environmental Services Assistance Team (ESAT) laboratory for Target Analyte List (TAL) metals analysis. Additionally, sediment samples were submitted to a Contract Laboratory Program (CLP) laboratory for TAL metals and poly-chlorinated biphenyl (PCB) analysis.

2.0 BACKGROUND

Mines in the Silverton area operated between the years 1874 and 1991. Mining activities in the Upper Animas basin, including Cement Creek, produced the waste rock and mill tailings sources from which contamination spread throughout the surface water pathway. This site assessment focused on Cement Creek, a major source of metals contamination to the Animas River.

Thirty-three individual sources of mine wastes have been identified in the Cement Creek drainage, totaling approximately 188,000 cubic yards (UOS 2009). Several investigations have been conducted in the Cement Creek basin by the Colorado Department of Public Health and the Environment (CDPHE),

but data were not appropriate for evaluating the site based on HRS criteria. Several sources of mine waste have been reclaimed to some degree through work carried out by the Bureau of Land Management (BLM), the CDPHE, the Colorado Division of Reclamation Mining and Safety (DRMS), and the Animas River Stakeholders Group (ARSG). The reclaimed waste areas are primarily in gulches that feed into lower Cement Creek. Most of the sources of mine wastes in the Upper Cement Creek basin remain in place. The wastes are rich in arsenic, cadmium, copper, lead, manganese, and zinc.

During the October 2010 sampling event, START aimed to characterize the impact of most tributaries on Cement Creek, and the impact of Cement Creek on the Animas River.

The purpose of this SR sampling event was to assist the Region 8 EPA in gathering data to determine whether this site should be considered for National Priority List (NPL) listing.

3.0 SITE ACTIVITIES

START members Megan Dudevoir, Bryan Williams, Andrew Longworth, and Nathan Williams mobilized to the site on October 25, 2010. START members collected 50 surface water samples, 54 sediment samples, 14 soil samples, and 4 adit water samples over the course of 8 days. The location of each sample was documented by collecting a GPS point. All sample locations, parameters, collection time, and collection date were entered into a site database. Sample containers were labeled, placed in coolers with ice, and kept under chain of custody. In the first 2 days of sampling, October 25 and 26, 2010, the temperatures were below freezing for the entire day, and snow fell throughout the day. In the higher elevations, as much as 1.5 feet of snow fell. In the remaining days of the field event, mid-day temperatures exceeded 32 degrees and START observed snow melt running into Cement Creek and its tributaries.

Site photos are provided in Appendix A.

4.0 SAMPLING AND ANALYSIS

Samples were collected in accordance with the approved FSP, with exceptions and justifications noted in Section 5.0 of this report. START personnel collected three duplicate and Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples for water and soil/sediment. Duplicate and MS/MSD samples were collected for samples UASW005, UASE005, UASW019, UASE019, UASW035, and UASE035. Surface water samples were hand-delivered to the EPA Region 8 ESAT Laboratory located in Golden, Colorado,

on November 2, 2010. Sediment and soil samples for PCB and total metals analysis were shipped via FedEx to the following CLP laboratory on November 2, 2010:

ALS Laboratory Group
960 West LeVoy Drive
Salt Lake City, Utah, 84123

Samples were received in good condition with custody seals intact. Approximate sample locations are illustrated in Figures 2 and 3 of the approved FSP.

4.1 SOIL SAMPLING

Soil samples were collected for total metals and PCB analysis. All of the soil samples were source samples and were collected in accordance with procedures described in UOS TSOP 4.16, "Surface and Shallow Depth Soil Sampling" (UOS 2005). Dedicated, disposable plastic scoops were used for source sample collection. All source samples were collected as biased grab samples from the 6- to 12-inch depth interval, with the exception of UASO001 and UASO002, which are described in Section 5.0 of this report. A sharp shooter shovel was used to accomplish the depth needed for the sample and was decontaminated between samples. Soil samples for total metals analysis were placed in 8-ounce high density polyethylene (HDPE) jars. Soil samples for PCB analysis were placed in 8-ounce amber glass jars. All samples were labeled with the sample identification number and stored in a cooler on ice pending shipping to the laboratory. Sample descriptions were logged in the field log book. A GPS point and photograph were collected for each sample location.

4.2 SURFACE WATER SAMPLING

Surface water samples (including adit water) were collected for total and dissolved metals analysis. Surface water sampling for total metals was conducted by facing upstream and immersing the 500 mL HDPE sample bottle directly into the sample media. Surface water sampling for dissolved metals was conducted by immersing a length of HDPE tubing in the sample media. Water was drawn through a 0.45 micron filter and into the 500 mL HDPE sample bottle using a peristaltic pump. Sample bottles and filters were certified pre-cleaned by the provider, and water was drawn through the tubing and discarded prior to sample collection to ensure contamination was not introduced by sampling supplies. Samples were preserved with nitric acid. UOS measured field parameters, including pH, temperature, and electrical

conductivity, of each sample. Field instrumentation was calibrated daily, and all calibration and field data was recorded in the field log book. Sampling was conducted from the farthest downstream location to the farthest upstream location to minimize the potential for cross-contamination. All surface water sample locations were photographed, recorded with GPS, and documented in the field log book during sampling activities.

4.3 SEDIMENT SAMPLING

Sediment samples were collected for total metals and PCB analysis. Sediment sampling was conducted according to UOS TSOP 4.17, "Sediment Sampling" (UOS 2005). Sediment sampling locations corresponded to surface water sampling locations and were collected immediately after the surface water sample was collected, proceeding from the most downstream location to the most upstream location. START attempted to collect primarily fines and avoid gravel, but in some locations fines were not readily available, and the sample contained some larger grains or gravel. Sediment samples were collected using a disposable, dedicated scoop. Total metal samples were placed into 8-ounce HDPE jars, and PCB samples were placed in 8-ounce amber glass jars. Sediment samples were labeled and stored in a cooler on ice pending shipping to the laboratory. All sediment sample locations were photographed, recorded with GPS, and documented in the project log book during sample activities.

5.0 FIELD SAMPLING PLAN DEVIATIONS

The following deviations from the FSP were made in the field based on assessments made by the START project manager and field team members:

- Samples UASW038 and UASE038 (Illinois Gulch) were not collected because the confluence of Illinois Gulch and Cement Creek was located on private property for which START did not have an access agreement.
- Samples UASW048 and UASE048 (Elk Tunnel discharge) were not collected because START personnel could not identify any flow from Elk Tunnel.
- Samples UASW051 and UASE051 (Mammoth Tunnel discharge) were not collected because START personnel could not identify any flow from Mammoth Tunnel.

- Samples UASW053 and UASE053 (Cement Creek downstream of Prospect Gulch) were not collected because they were located on private property for which START did not have an access agreement.
- Samples UASW055 and UASE055 (Cement Creek upstream of Prospect Gulch) were not collected because they were located on private property for which START did not have an access agreement.
- Samples UASW057 and UASE057 (Dry Gulch discharge) were not collected because START personnel could not identify any flow from Dry Gulch.
- The planned location for samples UASW011 and UASE011 was below all of the Gold King 7 Level waste piles. These samples were instead collected where runoff from the upper piles crosses the mine access road. The planned location could not be safely accessed at the toe of the lower piles due to an extremely steep slope, loose material, and snow.
- In addition to adit water, sediment samples were collected from adit discharge points, as START determined it would provide additional information.
- Fewer soil samples than planned were collected. START personnel dug below snow in several locations on each pile and performed XRF analysis of the driest soil in the hole. In-situ XRF analysis showed waste piles were more homogeneous than expected, so the number of samples required for characterization was reduced. Sample location identification numbers for soil samples were changed in the field to number them sequentially as they were collected. Soil sample identifications are as follows
 - UASO01: American Tunnel
 - UASO02: American Tunnel
 - UASO03: Red and Bonita Mine – top pile
 - UASO04: Red and Bonita Mine – middle pile
 - UASO05: Red and Bonita Mine – bottom pile
 - UASO06: Mogul North Mine waste pile
 - UASO07: Grand Mogul stope – west side
 - UASO08: Grand Mogul stope – east side

- UASO09: Grand Mogul Mine waste piles – east side
 - UASO10: Grand Mogul Mine waste piles – center
 - UASO11: Grand Mogul Mine waste piles – west side
 - UASO12: Mogul Mine waste piles – west side
 - UASO13: Mogul Mine waste piles – adjacent to shed
 - UASO14: Mogul Mine waste piles – east side
-
- Soil samples collected in the vicinity of the American Tunnel, UASO001 and UASO002, were obtained from 0 to 1 inch because the ground was frozen and the planned depth of 6 inches could not be obtained.
 - Soil samples were not collected at the Gold King 7 Level Mine because the waste piles for which START had an access agreement could not be accessed due to unsafe conditions, including extremely steep slope, loose waste rock material, and snow.
 - A sediment sample for PCB analysis was not collected at UASE059 (at the toe of Grand Mogul Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
 - A sediment sample for PCB analysis was not collected at UASE012 (above Gold King 7 Level Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
 - A sediment sample for PCB analysis was not collected at UASE030 (Cement Creek upstream of Grand Mogul Mine) because there was not enough sediment available for both metals and PCB analysis. Metals analysis was deemed more critical to project goals.
 - Sample AD005 was not collected because there is no adit discharge from Grand Mogul Mine.
 - Surface water and sediment samples were not collected at locations 025, 026, 027, 028, and 031 because START was not able to reach the highest elevations due to snowy and potentially unsafe conditions.
 - Soil samples were not collected from the Queen Anne Mine, the Adelphin Mine, and the Columbia Mine because START was not able to reach the highest elevations due to snowy and potentially unsafe conditions.

6.0 LIST OF REFERENCES

URS Operating Services, Inc. (UOS). 2005. "Technical Standard Operating Procedures for the Superfund Technical Assessment and Response Team (START), EPA Region 8."

URS Operating Services, Inc. (UOS). 2009. "Data Gap Analysis Report for Targeted National Priority Listing: Upper Animas Mining District San Juan County Colorado." October 13, 2009.

URS Operating Services, Inc. (UOS). 2010. "Field Sampling Plan: Upper Animas Mining District San Juan County Colorado." October 21, 2010.



Photo 1
Collection of UASW029 and UASE029 (Animas River downstream of Silverton).

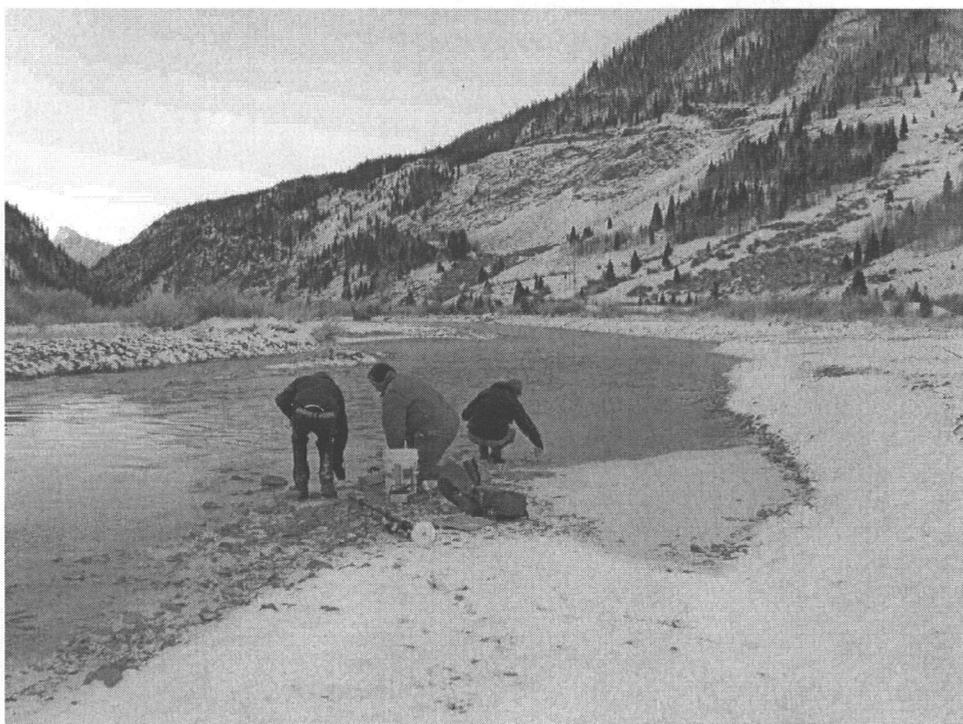


Photo 2
Collection of UASW032 and UASE032 (Animas River downstream of Mineral Creek).



Photo 3
Collection of UASW034 and UASE034 (Animas River upstream of Mineral Creek).

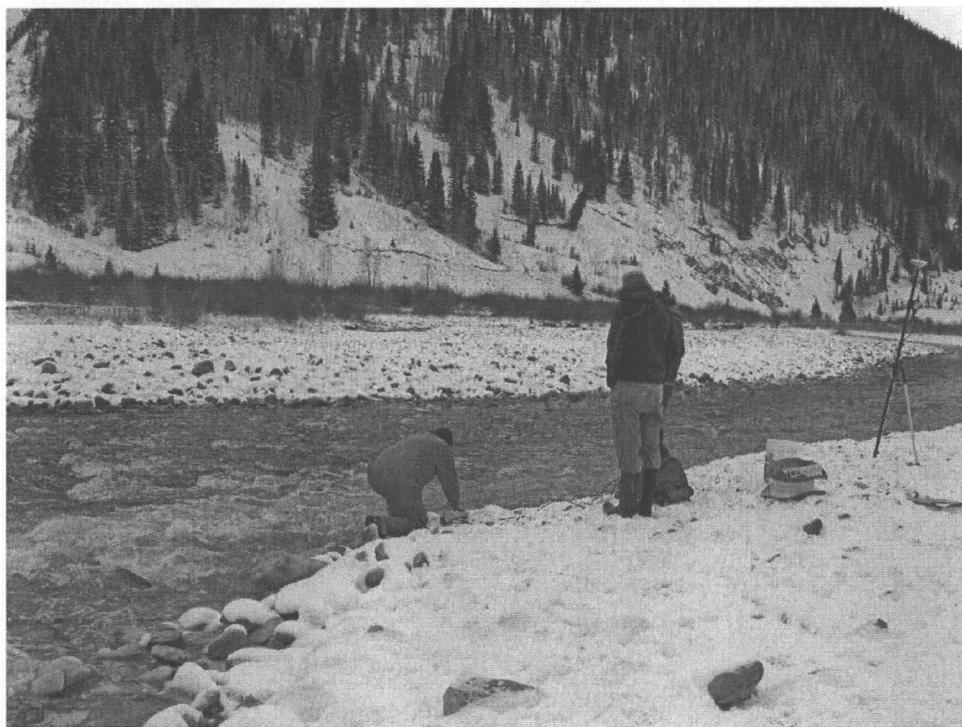


Photo 4
Collection of UASW001 and UASE001 (Animas River downstream of Cement Creek).



Photo 5
Collection of UASW002 and UASE002 (Cement Creek upstream of Animas River).



Photo 6
Collection of UASW003 and UASE003 (Animas River upstream of Cement Creek).

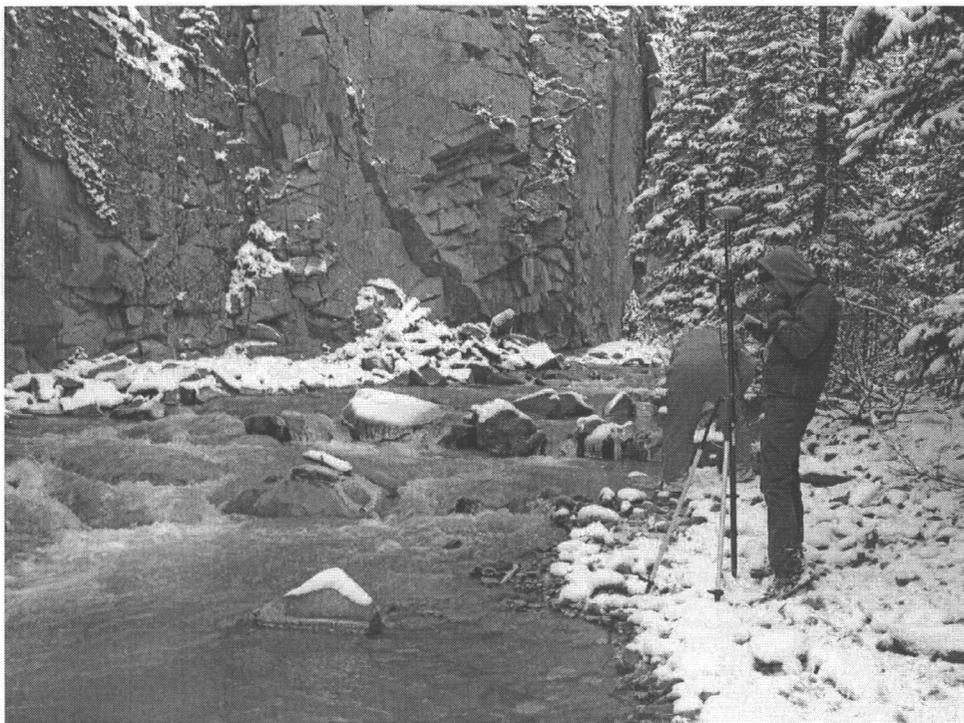


Photo 7
Collection of UASW035 and UASE035 (Cement Creek downstream of Kendrick Smelter).

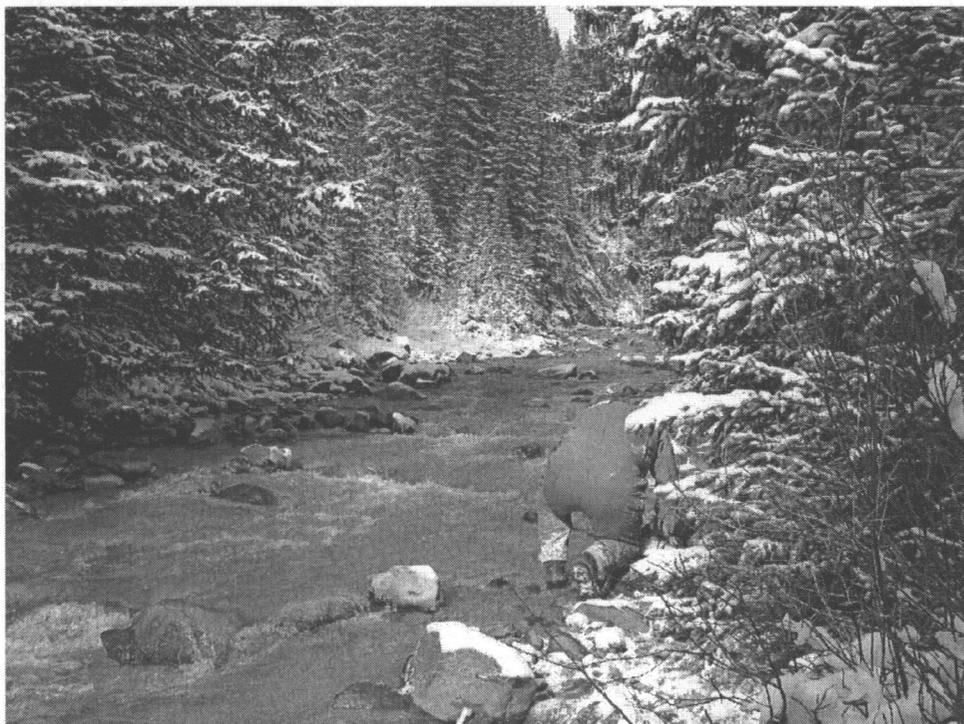


Photo 8
Collection of UASW036 and UASE036 (Cement Creek upstream of Kendrick Smelter).



Photo 9
Collection of UASW037 and UASE037 (Cement Creek downstream of Illinois Gulch).

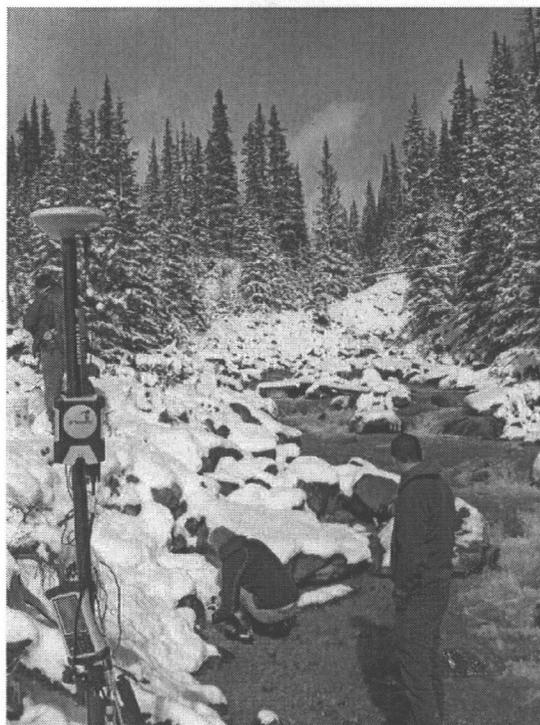


Photo 10
Collection of UASW039 and UASE039 (Cement Creek upstream of Illinois Gulch, and downstream of Ohio Gulch).



Photo 11
Location of UASW040 and UASE040 (Ohio Gulch discharge).



Photo 12
Collection of UASW041 and UASE041 (Cement Creek upstream of Ohio Gulch).



Photo 13
Collection of UASW042 and UASE042 (Cement Creek downstream of Anglo Saxon Mine).



Photo 14
Collection of UASW044 and UASE044 (Cement Creek upstream of Anglo Saxon Mine and downstream of Minnesota Gulch).



Photo 15
Collection of UASW043 and UASE043 (discharge from Anglo Saxon Mine).



Photo 16
Collection of UASW045 and UASE045 (discharge from Minnesota Gulch).



Photo 17

Collection of UASW046 and UASE046 (Cement Creek upstream of Minnesota Gulch).

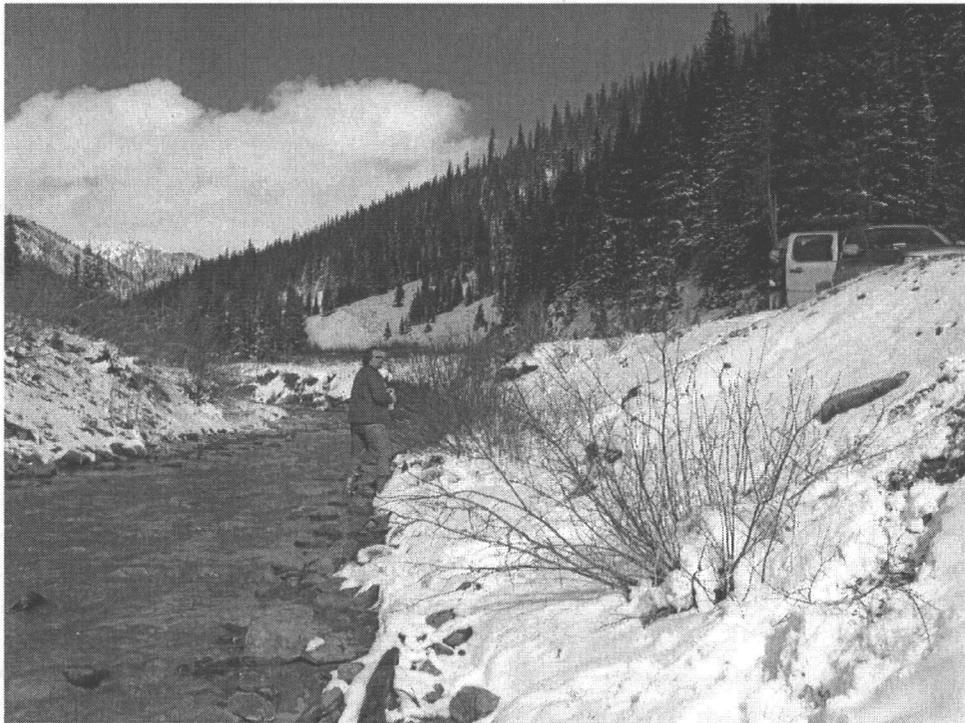


Photo 18

Collection of UASW047 and UASE047 (Cement Creek downstream of Elk Tunnel and Fairview Gulch).



Photo 19

Collection of UASW049 and UASE049 (Cement Creek downstream of Georgia Gulch).



Photo 20

Collection of UASW050 and UASE050 (Cement Creek upstream of Georgia Gulch).



Photo 21
Collection of UASW054 and UASE054 (discharge from Prospect Gulch).



Photo 22
Collection of UASW056 and UASE056 (Cement Creek downstream of Dry Gulch).



Photo 23
Collection of UASW058 and UASE058 (Cement Creek upstream of Dry Gulch).



Photo 24
Collection of UASW004 and UASE004 (Cement Creek downstream of the confluence with the south fork of Cement Creek).



Photo 25
Collection of UASW006 and UASE006 (Cement Creek upstream of the confluence with the south fork of Cement Creek).



Photo 26
Collection of UASW005 and UASE005 (south fork of Cement Creek).



Photo 27

Collection of UASW007 and UASE007 (American Tunnel discharge, immediately upstream of Cement Creek).



Photo 28

Collection of UAAD001 (discharge from the American Tunnel).



Photo 29
Collection of UASW008 and UASE008 (Cement Creek upstream of the American Tunnel).



Photo 30
Collection of UASW009 and UASE009 (Cement Creek downstream of the confluence with the north fork of Cement Creek).



Photo 31
Collection of UASW013 and UASE013 (Cement Creek upstream of the confluence with the north fork of Cement Creek).



Photo 32
Collection of UASW010 and UASE010 (north fork of Cement Creek).



Photo 33

Collection of UASW014 and UASE014 (Cement Creek downstream of Red and Bonita Mine).

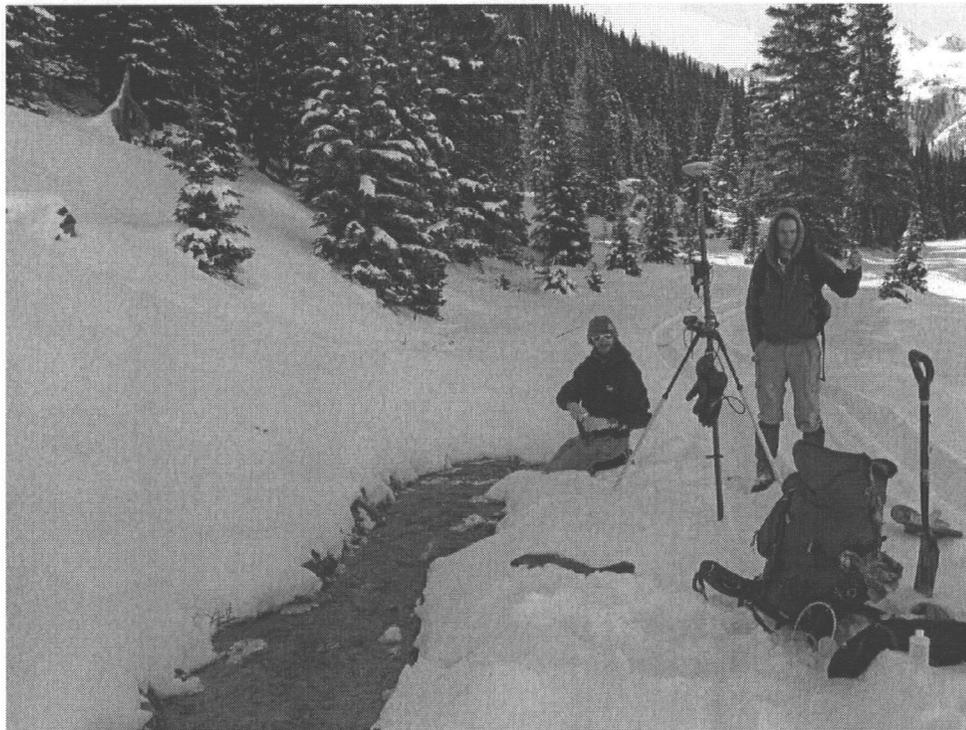


Photo 34

Collection of UASW015 and UASE015 (roadside channel below Red and Bonita Mine).



Photo 35
Collection of UAAD003 and UAAD003 (Red and Bonita Mine adit).

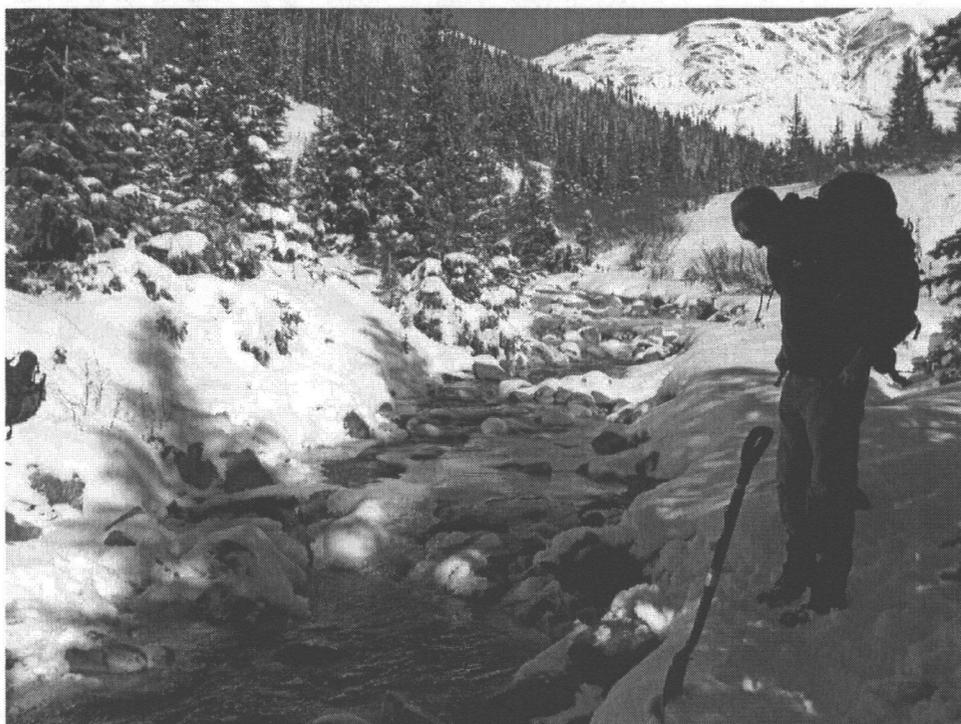


Photo 36
Collection of UASW016 and UASE016 (Cement Creek upstream of Red and Bonita Mine).



Photo 37
North fork of Cement Creek – flow is low and area is mostly frozen over.



Photo 38
Collection of UAAD002 (Gold King 7 Level adit).



Photo 39
Collection of UASW011 and UASE011 (north fork of Cement Creek downstream of Gold King 7 Level Mine – at road crossing).

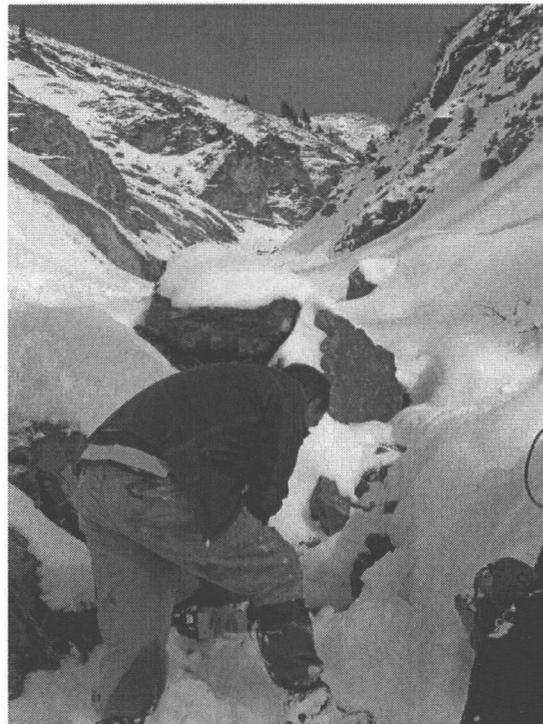


Photo 40
Collection of UASW012 and UASE012 (north fork of Cement Creek upstream of Gold King 7 Level Mine).



Photo 41
Location of UASW017 and UASE017 (Cement Creek downstream of Mogul Mine wetland).



Photo 42
Collection of UASW019 and UASE019 (flow through Mogul Mine wetland).



Photo 43
Collection of UASW018 and UASE018 (Cement Creek upstream of Mogul Mine wetland).



Photo 44
Collection of UASW018 and UASE018 (Cement Creek upstream of Mogul Mine wetland).



Photo 45
Collection of UASW020 and UASE020 (Cement Creek upstream of Mogul Mine).



Photo 46
Collection of UAAD004 (Mogul Mine adit discharge).

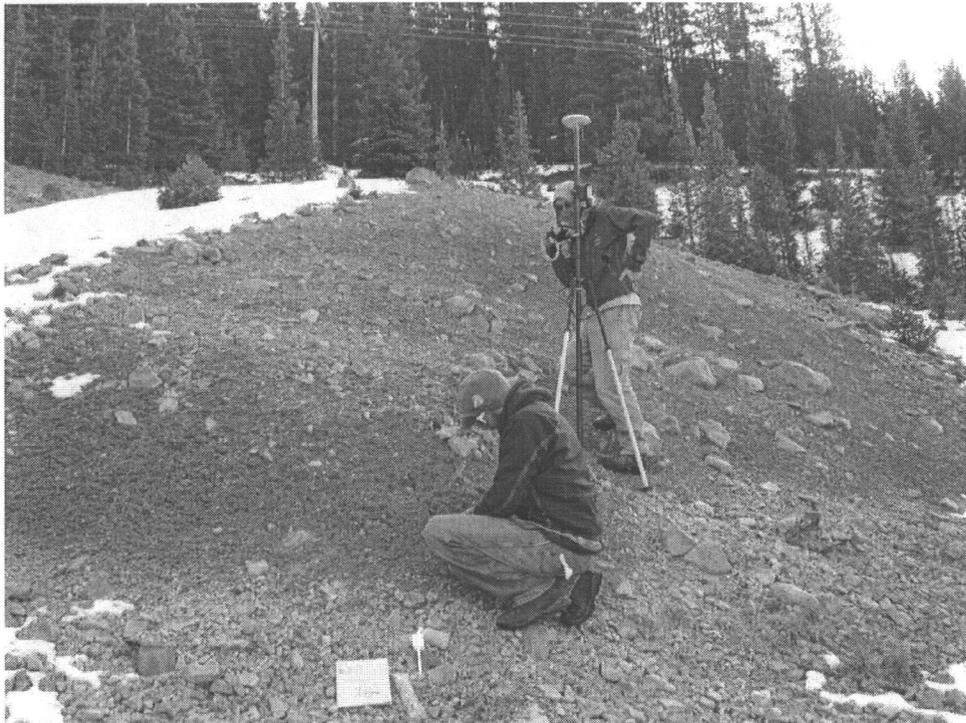


Photo 47
Collection of UASO002 (American Tunnel).



Photo 48
Collection of UASO003 (top pile at Red and Bonita).



Photo 49
Collection of UASO004 (middle pile at Red and Bonita).



Photo 50
Collection of UASO005 (bottom pile at Red and Bonita).



Photo 51
Red and Bonita waste piles.

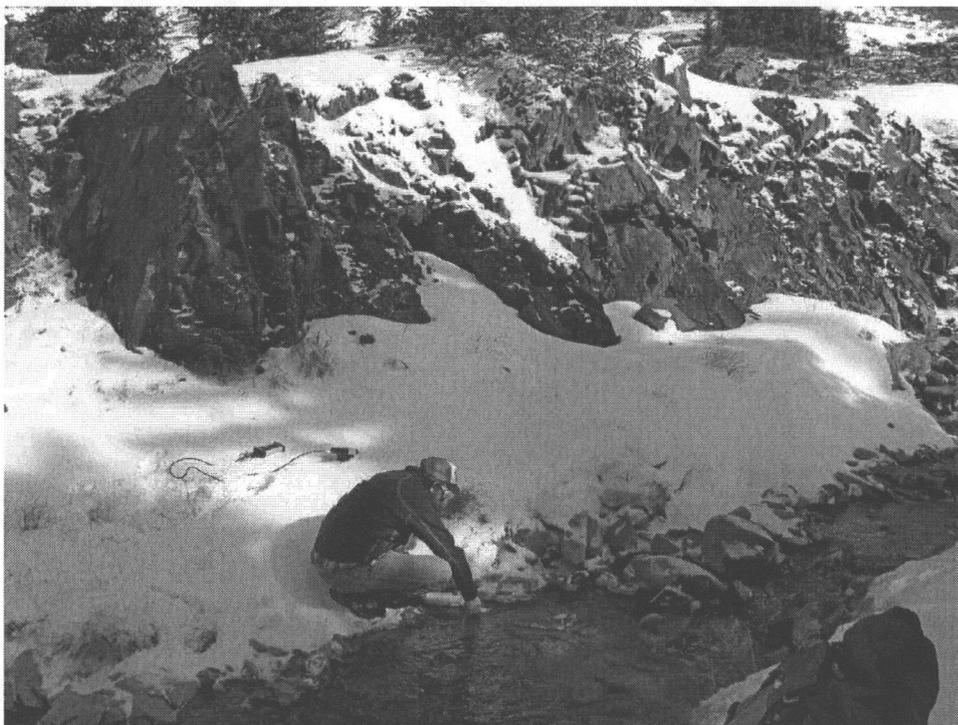


Photo 52
Collection of UASW021 and UASE021 (Cement Creek downstream of Mogul North Mine).



Photo 53
Collection of UASW022 and UASE022 (drainage from of Mogul North Mine).



Photo 54
Collection of UASO006 (Mogul North waste pile).



Photo 55
Seepage from the toe of the Mogul North waste pile.



Photo 56
Collection of UASW023 and UASE023 (Cement Creek upstream of Queen Anne Mine).



Photo 57
Collection of UASW024 and UASE024 (drainage from Queen Anne Mine).

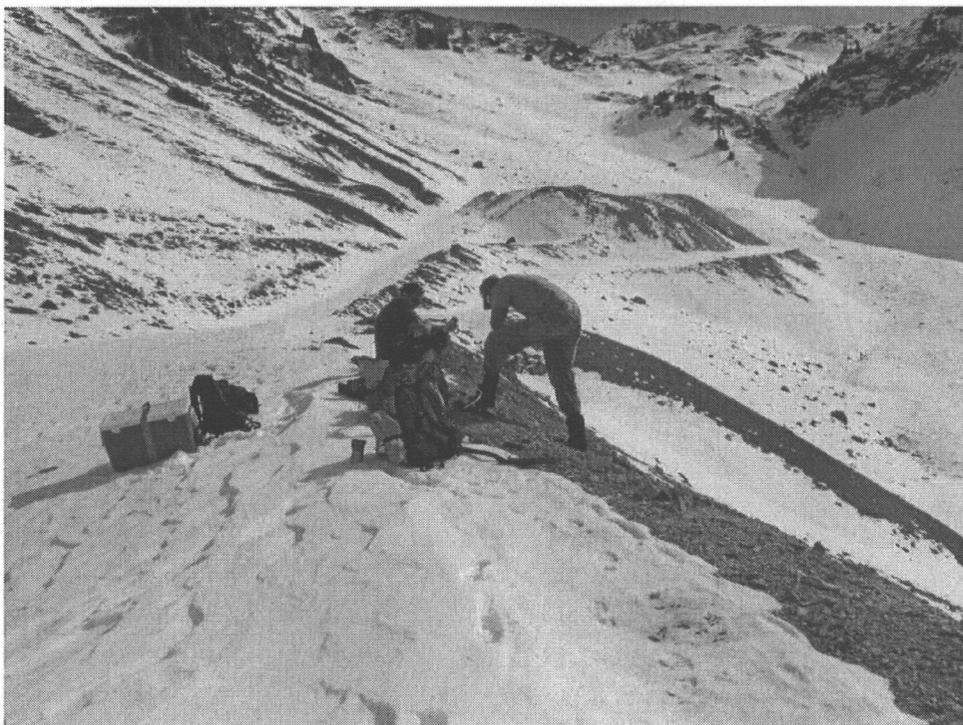


Photo 58
Collection of UASO007 (Grand Mogul Mine stope – west side).



Photo 59
Collection of UASO008 (Grand Mogul Mine stope – east side).



Photo 60
Collection of UASW059 and UASE059 (drainage from Grand Mogul Mine).

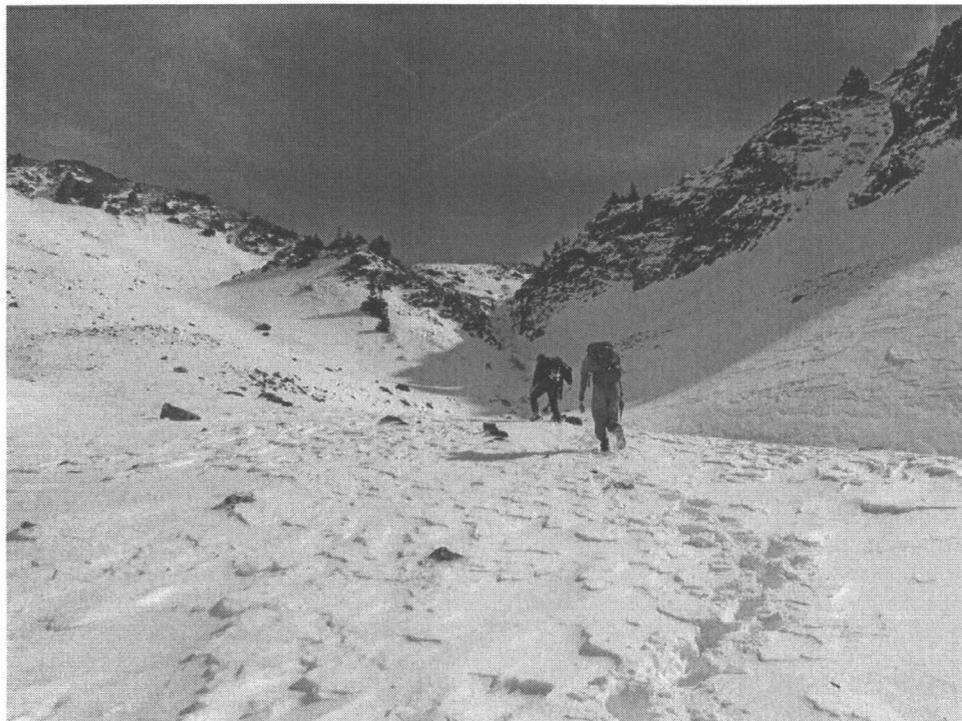


Photo 61
Sample team hiking above Grand Mogul Mine.



Photo 62
Collection of UASW030 and UASE030 (Cement Creek upstream of Grand Mogul Mine).



Photo 63
Grand Mogul Mine and Mogul Mine stope waste piles.



Photo 64
Grand Mogul Mine easternmost waste pile.



Photo 65
Collection of UASO009 (Grand Mogul Mine waste piles – east side).



Photo 66
Collection of UASO010 (Grand Mogul Mine waste piles – center).

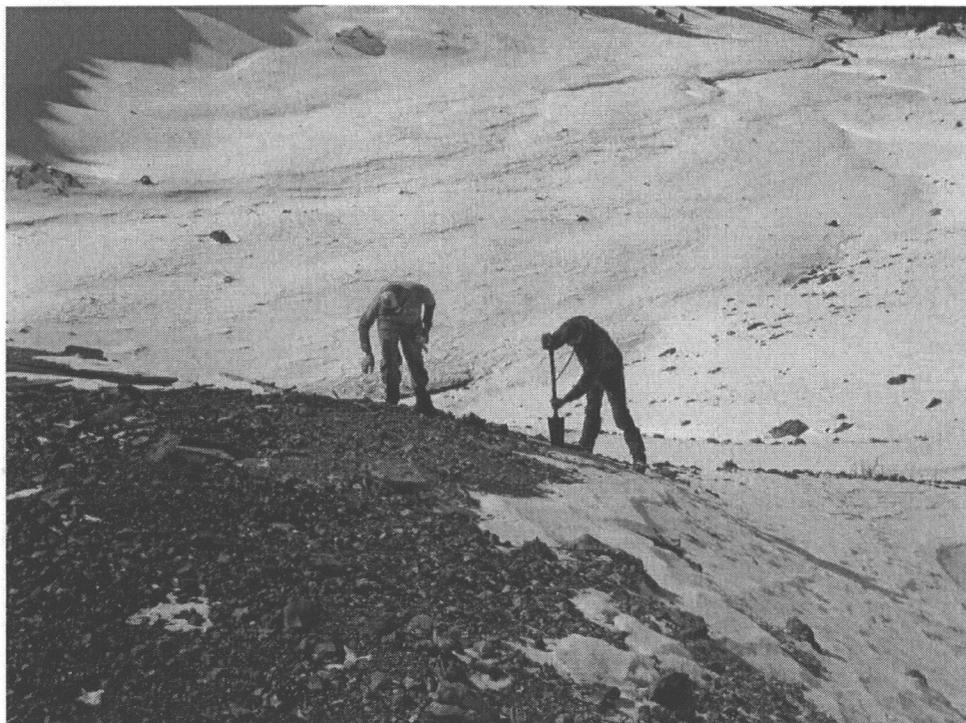


Photo 67
Collection of UASO011 (Grand Mogul Mine waste piles – west side).



Photo 68
Collection of UASO012 (Mogul Mine waste piles – west side).



Photo 69
Collection of UASO013 (Mogul Mine waste piles – adjacent to shed).



Photo 70
Collection of UASO014 (Mogul Mine waste piles – east side).



Photo 71
Mogul Mine waste piles.

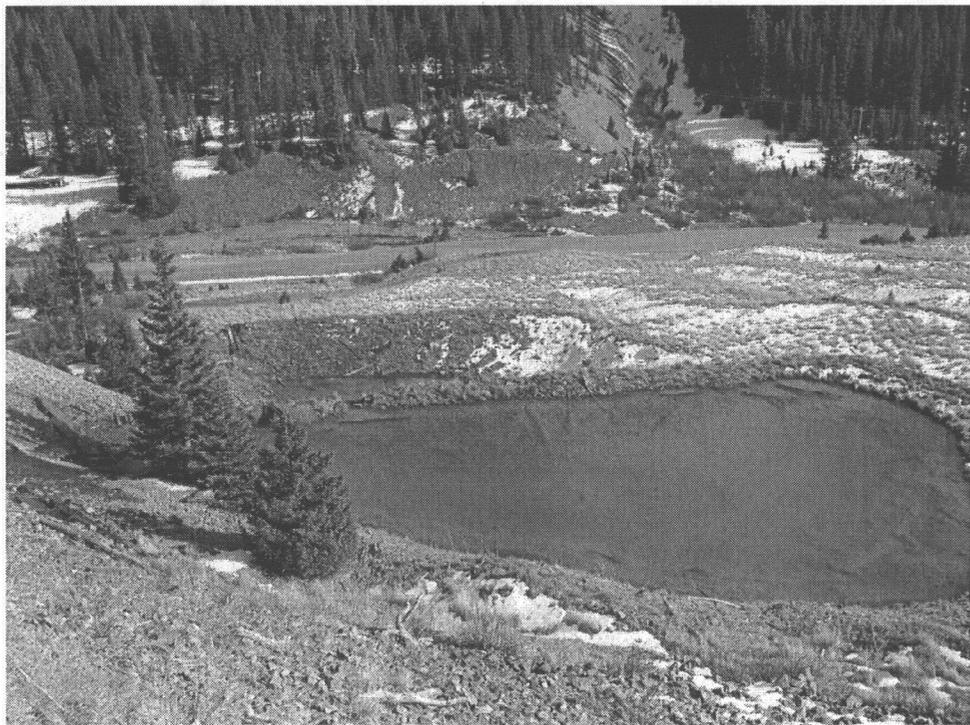


Photo 72
Treatment pond in the vicinity of the Mammoth Tunnel.



Photo 73
Runoff entering treatment pond in the vicinity of the Mammoth Tunnel.



Photo 74
Steep slope of Gold King 7 Level waste piles.

APPENDIX B

**Data Validation Packages:
Form I Data Sheets and Chain of Custody Forms**

**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case/TDD No.	Site Name	Operable Unit	
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	MH35E5	

Review Assigned Date: December 15, 2010
 Review Completion Date: February 18, 2011

Data Validator: Fred Luck
 Report Reviewer: Lesley Boyd

Sample ID	Matrix	Analysis
MH35E5	Sediment	CLP -Metals
MH35E6		
MH35E7		
MH35E8		
MH35E9		
MH35F0		
MH35F1		
MH35F2		
MH35F3		
MH35F4		
MH35F5		
MH35F6		
MH35F7		

Sample ID	Matrix	Analysis
MH35F8	Sediment	CLP -Metals
MH35F9		
MH35G0		
MH35G1		
MH35G2		
MH35G3		
MH35G4		

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
- () Data are UNACCEPTABLE according to EPA Functional Guidelines.
- (X) Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X

CLP Project Officer Attention Required? Yes _____ No X If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT

REVIEW NARRATIVE SUMMARY

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, Case No. 40755, SDG No. MH35E5, consisted of twenty sediment samples for metals by ICP-AES and ICP-MS (ISM01.2). The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
All Samples	Antimony	U	Blank Contamination	3
MH35E5, MH35E6, MH35F0, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F7, MH35F9, MH35G1, MH35G2, MH35G3, MH35G4	Beryllium			
MH35E5, MH35E6, MH35F0, MH35F3, MH35F4, MH35F6, MH35F7, MH35G0, MH35G1, MH35G2	Cadmium			
MH35F3, MH35F5, MH35G1	Calcium			
MH35F8	Chromium			
MH35F8	Magnesium			
MH35E9, MH35F0, MH35F8, MH35G1, MH35G3	Potassium			
MH35E9, MH35F8	Silver			
All Samples	Sodium			
MH35E5, MH35E6, MH35E7, MH35E8, MH35E9, MH35F0, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F8, MH35F9, MH35G1, MH35G3	Thallium			

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35E7, MH35E8, MH35E9, MH35F8, MH35G0	Beryllium	J+	Potentially false positive detection in ICS check sample	4
MH35E5, MH35E6, MH35E7, MH35E8, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F7, MH35F9, MH35G0, MH35G2, MH35G4	Potassium			
MH35E5, MH35E6, MH35E7, MH35E8, MH35F0, MH35F1, MH35F2, MH35F3, MH35F4, MH35F5, MH35F6, MH35F7, MH35F9, MH35G0, MH35G1, MH35G2, MH35G3, MH35G4	Silver			
MH35F7, MH35G0, MH35G2, MH35G4	Thallium			
All Samples	Barium, Zinc	J/UJ	Original & Duplicate both >5x the CRQL and RPD > 20%	6
	Cadmium		Original and/or Duplicate < 5x the CRQL and absolute difference > CRQL	
			MS 30 - 74%R, Post Digestion Spike %R ≥ 75%	7
	Antimony, Selenium, Silver		MS <30%R, Post Digestion Spike %R ≥ 75%	
	Copper	J	MS > 125%R, Post Digestion Spike %R ≤ 125%	8
	Arsenic, Beryllium, Cadmium, Cobalt, Copper, Nickel, Potassium, Sodium, Zinc			

1. PRESERVATION AND HOLDING TIMES

All technical holding times and preservation criteria were met.

Yes ___ No X

Comments: The samples were analyzed within 180 days for the ICP metals. According to the Sample Log-In Sheet and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. The Sample Log-In Sheet further indicates that neither cooler contained a Cooler Temperature Indicator Bottle, as indicated on the form to be required. There is also no indication that SMO was contacted regarding this issue, neither is any documentation of the resolution or indication of how the cooler temperature was derived provided. The TR/COC also did not designate a sample for laboratory QC, but the documentation of the resolution of this issue is provided in the SDG.

When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

The sampler did not designate a specific sample on the TR/COC for Laboratory QC; in accordance with reported previous Region 8 direction, the laboratory did select a sample (MH35G4) for laboratory QC. The reviewer has not been provided any information regarding PE, field blank, or rinsate samples; therefore cannot evaluate whether the selected sample was a PE, field blank, or rinsate sample.

No other shipping or receiving problems were noted. Chain-of-custody, summary forms, and raw data were evaluated.

2. INSTRUMENT CALIBRATIONS: INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICV AND CCV)

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes X No ___

Comments: None.

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes X No ___

Comments: None.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes X No

Comments: None.

3. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes X No

Comments: For the ICP-AES analyses, the ICB was rerun.

The continuing calibration blanks were run at 10% frequency.

Yes X No

Comments: Continuing calibration blanks were run every 10 samples.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No

Comments: None.

All analyzed blanks were free of contamination.

Yes No X

Comments: The following table lists the blanks with contamination that resulted in sample qualification, elements present, affected samples, and data qualifiers:

Blank Contaminants

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Antimony	1	0.0097	0.013	MH35E5	1.3	2.1 U
					MH35E6	0.68	1.4 U
					MH35E7	0.22	1.3 U
					MH35E8	0.98	1.6 U
					MH35E9	0.79	1.3 U
					MH35F0	0.44	1.7 U
					MH35F1	1.1	1.6 U
					MH35F2	0.56	1.4 U
					MH35F3	0.87	1.6 U
					MH35F4	0.88	1.4 U
					MH35F5	1.2	1.3 U
					MH35F6	0.38	1.5 U
					MH35F7	0.58	1.9 U
					MH35F8	0.94	2.5 U
					MH35F9	0.41	1.3 U
					MH35G0	0.42	1.4 U
MH35G1	1.4	3.8 U					
MH35G2	0.44	1.6 U					
MH35G3	0.59	1.3 U					
MH35G4	0.33	1.6 U					
PB	Beryllium	0.5	0.0032	0.011	MH35E5	0.44	1.0 U
					MH35E6	0.33	0.72 U
					MH35F0	0.66	0.87 U
					MH35F1	0.39	0.78 U
					MH35F2	0.38	0.68 U
					MH35F3	0.41	0.82 U
					MH35F4	0.38	0.71 U
					MH35F5	0.41	0.64 U
					MH35F6	0.41	0.74 U
					MH35F7	0.57	0.93 U
					MH35F9	0.46	0.66 U
					MH35G1	0.29	1.9 U
					MH35G2	0.47	0.78 U
					MH35G3	0.46	0.64 U
MH35G4	0.56	0.81 U					
PB	Cadmium	0.5	0.0027	0.500	MH35E5	0.74	1.0 U
					MH35E6	0.66	0.72 U
					MH35F0	0.78	0.87 U
					MH35F3	0.52	0.82 U
					MH35F4	0.47	0.71 U
					MH35F6	0.51	0.74 U
					MH35F7	0.79	0.93 U
					MH35G0	0.35	0.68 U
					MH35G1	0.45	1.9 U
					MH35G2	0.44	0.78 U
PB	Calcium	500	1.7	4.404	MH35F3	791	822 U
					MH35F5	230	644 U
					MH35G1	1150	1900 U
PB	Chromium	1	0.026	1.000	MH35F8	1.6	2.5 U
PB	Magnesium	500	1.2	500	MH35F8	447	1240 U

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Potassium	500	5.8	55.883	MH35E9 MH35F0 MH35F8 MH35G1 MH35G3	375 842 209 1160 510	674 U 865 U 1240 U 1900 U 636 U
PB	Silver	0.5	0.0023	0.010	MH35E9 MH35F8	0.48 0.22	0.67 U 1.2 U
PB	Sodium	500	0.73	18.271	MH35E5 MH35E6 MH35E7 MH35E8 MH35E9 MH35F0 MH35F1 MH35F2 MH35F3 MH35F4 MH35F5 MH35F6 MH35F7 MH35F8 MH35F9 MH35G0 MH35G1 MH35G2 MH35G3 MH35G4	117 60.2 49.7 92.9 180 58.1 88.1 75.6 76.1 68.7 69.8 90.6 109 32.3 62.4 56.6 77.5 100 25.2 94.7	1040 U 723 U 641 U 814 U 674 U 865 U 781 U 676 U 822 U 714 U 644 U 741 U 926 U 1240 U 657 U 684 U 1900 U 782 U 636 U 813 U
PB	Thallium	0.5	0.0015	0.007	MH35E5 MH35E6 MH35E7 MH35E8 MH35E9 MH35F0 MH35F1 MH35F2 MH35F3 MH35F4 MH35F5 MH35F6 MH35F8 MH35F9 MH35G1 MH35G3	0.72 0.41 0.32 0.45 0.19 0.31 0.62 0.41 0.75 0.69 0.59 0.44 0.26 0.36 0.43 0.42	1.0 U 0.72 U 0.64 U 0.81 U 0.67 U 0.87 U 0.78 U 0.68 U 0.82 U 0.71 U 0.64 U 0.74 U 1.2 U 0.66 U 1.9 U 0.64 U

4. INDUCTIVELY COUPLED PLASMA - INTERFERENCE CHECK SAMPLE (ICP-ICS)

The ICP interference check sample (ICS) was run at the beginning and end of each sample analysis run and every 20 analytical samples, but not prior to the ICV.

Yes X No

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within \pm the CRQL.

Yes X No

Comments: None.

Sample results for aluminum, calcium, iron, and magnesium were less than the ICSA values or no interference was noted.

Yes X No NA

Comments: None.

Sample results contain potential false positives and false negatives.

Yes X No

Comments: The following table lists the elements with potential false positives or false negatives that resulted in sample qualification, affected samples, and data qualifiers:

ICP Interferences

Element	Concentration Found in ICSA Sample (ug/L)	Affected Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
Beryllium	0.37	MH35E7 MH35E8 MH35E9 MH35F8 MH35G0	>MDL	J+
Potassium	1020	MH35E5 MH35E6 MH35E7 MH35E8 MH35F1 MH35F2 MH35F3 MH35F4 MH35F5 MH35F6 MH35F7 MH35F9 MH35G0 MH35G2 MH35G4		
Silver	0.015	MH35E5 MH35E6 MH35E7 MH35E8 MH35F0 MH35F1 MH35F2 MH35F3 MH35F4 MH35F5 MH35F6 MH35F7 MH35F9 MH35G0 MH35G1 MH35G2 MH35G3 MH35G4		
Thallium	0.056	MH35F7 MH35G0 MH35G2 MH35G4		

5. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No

Comments: None.

All results were within control limits OF 70-130%.

Yes X No

Comments: None.

6. FORM 6 & 12 - DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No NA

Comments: None.

The RPDs were calculated correctly.

Yes X No NA

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were within $\pm 20\%$ (limits of $\pm 35\%$ apply for soil/sediments/tailings samples).

Yes No X NA

Comments: The following table lists the duplicate results outside control limits, samples affected, and data qualifiers:

Element	RPD	QC Limit	Samples Affected	Qualifiers
Barium	57%	20%	All samples	J / UJ
Zinc	75%			

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of CRQL (absolute difference < CRQL for soils).

Yes___ No X NA___

Comments: The following table lists the duplicate results outside control limits, samples affected, and data qualifiers:

Element	Sample / Duplicate Result (mg / Kg)	% RPD	5x CRQL (mg / Kg)	Samples Affected	Qualifiers
Cadmium	2.73 / 1.13	83 %	2.5	All samples	J / UJ

7. SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No___ NA___

Comments: None.

The percent recoveries (%Rs) were calculated correctly.

Yes X No___ NA___

Comments: None.

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes___ No X

Comments: The following table lists the spike recoveries outside control limits, post digestion spike recoveries, samples affected, and data qualifiers:

Element	Matrix Spike %R	Post-Digestion %R	Samples Affected	Qualifiers
Antimony	13%	168%	All samples	J/UJ
Cadmium	61%	83%		J
Copper	182%	77%		J/UJ
Selenium	6%	114%		
Silver	1%	87%		

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Ag, Hg).

Yes X No ___ NA ___

Comments: None.

8. ICP SERIAL DILUTION

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes X No ___

Comments: None.

The serial dilution was without interference problems as defined by the SOW.

Yes ___ No X

Comments: The following serial dilution %Ds were greater than 10% and the original sample result was at least 50* the MDL:

Element	% Difference	Samples Affected	Qualifiers
Arsenic	30%	All samples	J
Beryllium	14%		
Cadmium	11%		
Cobalt	13%		
Copper	18%		
Nickel	15%		
Potassium	19%		
Sodium	30%		
Zinc	30%		

9. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

Yes__ No__ NA X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

10. FORM 10 - INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes X No__

Comments: None.

11. FORM 12 - PREPARATION LOG

Information on the preparation of samples for analysis was reported on Form 12.

Yes X No__

Comments: None.

12. FORM 13 - ANALYSIS RUN LOG

A Form 13 with the required information was filled out for each analysis run in the data package.

Yes X No__

Comments: None.

13. Additional Comments or Problems/Resolutions Not Addressed Above

Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

INORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality. Use of additional qualifiers should be carefully considered. Definitions for all qualifiers used should be provided with each report.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." The data are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample.
- J+ - The associated numerical value is an estimated quantity but the result may be biased high.
- J- - The associated numerical value is an estimated quantity but the result may be biased low.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

ACRONYMS

AA	Atomic Absorption
Ag	Silver
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRA	CRQL standard required for AA
CRQL	Contract Required Quantitation Limit
CRI	CRQL standard required for ICP
CV	Cold Vapor
EPA	U.S. Environmental Protection Agency
GFAA	Graphite Furnace Atomic Absorption
Hg	Mercury
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
ICSA	Interference Check Sample (Solution A)
ICSAB	Interference Check Sample (Solution AB)
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LRA	Linear Range Verification Analysis
MDL	Method Detection Limit
PDS	Post Digestion Spike
QC	Quality Control
RPD	Relative Percent Difference
RPM	Regional Project Manager
RSD	Percent Relative Standard Deviation
SA	Spike Added
SAS	Special Analytical Services
SDG	Sample Delivery Group
SOW	Statement of Work
SR	Sample Result
SSR	Spiked Sample Result

000146

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768001
 % Solids: 48.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6860			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1100			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	78100			P
7439-92-1	Lead				
7439-95-4	Magnesium	3030			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1700		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	117.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000148

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E6

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768002
% Solids: 69.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7030			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1010			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	68800			P
7439-92-1	Lead				
7439-95-4	Magnesium	4080			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	889.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	60.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J + K
723 JH
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000150

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768003
 % Solids: 78.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8570			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2560			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	20800			P
7439-92-1	Lead				
7439-95-4	Magnesium	5610			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	745.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	49.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ H

641 JH
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000152

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768004
 % Solids: 61.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12300			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2010			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	58100			P
7439-92-1	Lead				
7439-95-4	Magnesium	4270			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1260		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	92.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000154

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35E9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768005
 % Solids: 74.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8000			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2050			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	26000			P
7439-92-1	Lead				
7439-95-4	Magnesium	3730			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	375.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	180.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000156

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768006
 % Solids: 57.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11600			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1810			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	44300			P
7439-92-1	Lead				
7439-95-4	Magnesium	6090			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	842.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	58.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000157

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768006
 % Solids: 57.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.44	J	N	MS
7440-38-2	Arsenic	13.3		E	MS
7440-39-3	Barium	123.		*	MS
7440-41-7	Beryllium	0.66	J	E	MS
7440-43-9	Cadmium	0.78	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.7		*	MS
7440-48-4	Cobalt	5.4		E	MS
7440-50-8	Copper	91.4		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	366.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1440		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.51	J	N	MS
7440-22-4	Silver	1.2		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.31	J		MS
7440-62-2	Vanadium	25.8		*	MS
7440-66-6	Zinc	241.		*E	MS
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000158

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768007
 % Solids: 64.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5900			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	934.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	71700		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2440			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1300		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	88.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ Fe
781 U 32
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000160

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768008
 % Solids: 74.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7040			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1040			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	62200		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	3760			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1090		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	75.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ M

676 U M
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000161

EPA SAMPLE NO.

MH35F2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768008
 % Solids: 74.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.56	J	N	MS
7440-38-2	Arsenic	35.3		E	MS
7440-39-3	Barium	342.		*	MS
7440-41-7	Beryllium	0.38	J	E	MS
7440-43-9	Cadmium	1.4		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.7		*	MS
7440-48-4	Cobalt	4.8		E	MS
7440-50-8	Copper	98.6		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	306.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	580.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.4		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.0	J	N	MS
7440-22-4	Silver	1.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.41	J		MS
7440-62-2	Vanadium	42.3		*	MS
7440-66-6	Zinc	360.		*E	MS
57-12-5	Cyanide				

1.4 UJM
J #
J #
0.68 U #
J #
J # KA 3/19/11
J #
J # KA 2/19/11
J #
3.4 U J #
J + #
0.68 U #
J # KA 2/19/11
J #
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000162

EPA SAMPLE NO.

MH35F3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768009
 % Solids: 60.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4890			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	791.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	88900		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2180			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1200		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	76.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

822 U⁷

J + 7

822 U⁷
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000163

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F3

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768009
% Solids: 60.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.87	J	N	MS
7440-38-2	Arsenic	57.0		E	MS
7440-39-3	Barium	317.		*	MS
7440-41-7	Beryllium	0.41	J	E	MS
7440-43-9	Cadmium	0.52	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.8		*	MS
7440-48-4	Cobalt	3.6		E	MS
7440-50-8	Copper	41.8		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	541.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	436.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.2		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.4	J	N	MS
7440-22-4	Silver	2.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.75	J		MS
7440-62-2	Vanadium	48.6		*	MS
7440-66-6	Zinc	153.		*E	MS
57-12-5	Cyanide				

1.6 UJA
 J H
 J H
 0.82 U H
 0.82 U H
 J H KA
 3/19/11
 J H
 J H
 J H
 J H
 4.1 U J H
 J H
 0.82 U H
 J H KA
 3/19/11
 J H
 2/19/11

Color Before: ORANGE Clarity Before: Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
E: The reported value is estimated due to the presence of interference.

000164

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768010
 % Solids: 70.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5540			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	735.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	56500			P
7439-92-1	Lead				
7439-95-4	Magnesium	2810			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1270		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	68.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768010
 % Solids: 70.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.88	J	N	MS
7440-38-2	Arsenic	34.0		E	MS
7440-39-3	Barium	422.		*	MS
7440-41-7	Beryllium	0.38	J	E	MS
7440-43-9	Cadmium	0.47	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.9		*	MS
7440-48-4	Cobalt	3.1		E	MS
7440-50-8	Copper	29.8		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	361.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	311.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.8		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.3	J	N	MS
7440-22-4	Silver	1.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.69	J		MS
7440-62-2	Vanadium	34.6		*	MS
7440-66-6	Zinc	136.		*E	MS
57-12-5	Cyanide				

Handwritten notes:
 1.40 J¹²
 J¹²
 J¹²
 0.710 J¹²
 0.710 J¹²
 J¹² KA 3/9/11
 J¹²
 J¹²
 J¹²
 J¹² KA 3/9/11
 J¹²
 3.60 J¹²
 J¹²
 0.710 J¹²
 J¹² KA 3/9/11
 J¹²
 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000166

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768011
 % Solids: 77.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5240			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	230.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	44400			P
7439-92-1	Lead				
7439-95-4	Magnesium	2570			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1230		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	69.8	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

644 U #

J+ #

644 U #

2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000167

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F5

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768011
% Solids: 77.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.2	J	N	MS
7440-38-2	Arsenic	54.8		E	MS
7440-39-3	Barium	582.		*	MS
7440-41-7	Beryllium	0.41	J	E	MS
7440-43-9	Cadmium	2.6		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.5		*	MS
7440-48-4	Cobalt	4.0		E	MS
7440-50-8	Copper	40.4		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	598.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	304.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.0	J	N	MS
7440-22-4	Silver	3.6		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.59	J		MS
7440-62-2	Vanadium	36.4		*	MS
7440-66-6	Zinc	604.		*E	MS
57-12-5	Cyanide				

1.3 UJ
J #
J #
0.64 U #
J #
J # KA
J # 3/9/11
J #
J #
J # KA
J # 2/8/11
J #
3.2 U # J #
J # #
0.64 U # KA
J # # 3/9/11
J #
M/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: WHITE Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000168

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768012
 % Solids: 67.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8220			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1040			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	94600		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	4550			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1060		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	80.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000169

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768012
 % Solids: 67.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.38	J	N	MS
7440-38-2	Arsenic	34.3		E	MS
7440-39-3	Barium	121.		*	MS
7440-41-7	Beryllium	0.41	J	E	MS
7440-43-9	Cadmium	0.51	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.6		*	MS
7440-48-4	Cobalt	5.5		E	MS
7440-50-8	Copper	55.2		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	334.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	831.		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.81	J	N	MS
7440-22-4	Silver	1.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.44	J		MS
7440-62-2	Vanadium	49.9		*	MS
7440-66-6	Zinc	186.		*E	MS
57-12-5	Cyanide				

1.5 UJ
J #
J #
0.74 U #
0.74 U #
J # KA 2/9/11
J #
J #
J # KA 2/9/11
J #
3.7 U J #
J+ #
0.74 U #
J # KA 2/9/11
J #
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000170

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768013
 % Solids: 54.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5710			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1040			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	123000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2360			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1410		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	109.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000171

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768013
 % Solids: 54.0 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.58	J	N	MS
7440-38-2	Arsenic	37.2		E	MS
7440-39-3	Barium	258.		*	MS
7440-41-7	Beryllium	0.57	J	E	MS
7440-43-9	Cadmium	0.79	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	8.4		*	MS
7440-48-4	Cobalt	4.4		E	MS
7440-50-8	Copper	59.7		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	417.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	636.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.6		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.1	J	N	MS
7440-22-4	Silver	2.2		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.99			MS
7440-62-2	Vanadium	71.7		*	MS
7440-66-6	Zinc	225.		*E	MS
57-12-5	Cyanide				

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000172

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768014
 % Solids: 40.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5060			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	4130			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	860000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	447.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	209.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	32.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1240 U⁷²
1240 U⁷³
1240 U⁷⁴
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000173

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
MH35F8

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768014
% Solids: 40.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.94	J	N	MS
7440-38-2	Arsenic	103.		E	MS
7440-39-3	Barium	36.3		*	MS
7440-41-7	Beryllium	10.3		E	MS
7440-43-9	Cadmium	4.1		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	1.6	J	*	MS
7440-48-4	Cobalt	17.0		E	MS
7440-50-8	Copper	110.		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	255.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	2410		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.21	J	N	MS
7440-22-4	Silver	0.22	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.26	J		MS
7440-62-2	Vanadium	13.4		*	MS
7440-66-6	Zinc	2470		D*E	MS
57-12-5	Cyanide				

2.5 U ~~MS~~
J ~~MS~~
J ~~MS~~
J+ ~~MS~~
J ~~MS~~
2.5 U ~~MS~~
J ~~MS~~
J ~~MS~~
J ~~MS~~
J ~~MS~~
J ~~MS~~
6.2 U ~~MS~~
1.2 U ~~MS~~
1.2 U ~~MS~~
J ~~MS~~
J ~~MS~~
2/18/11

Color Before: RED Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000174

EPA SAMPLE NO.

MH35F9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768015
 % Solids: 76.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8860			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2020			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	67200		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	5080			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	933.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	62.4	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ #
6570 #
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000175

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35F9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768015
 % Solids: 76.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.41	J	N	MS
7440-38-2	Arsenic	34.0		E	MS
7440-39-3	Barium	191.		*	MS
7440-41-7	Beryllium	0.46	J	E	MS
7440-43-9	Cadmium	2.0		*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	7.0		*	MS
7440-48-4	Cobalt	5.5		E	MS
7440-50-8	Copper	76.4		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	361.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	804.		D*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.6		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.1	J	N	MS
7440-22-4	Silver	1.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.36	J		MS
7440-62-2	Vanadium	45.2		*	MS
7440-66-6	Zinc	478.		*E	MS
57-12-5	Cyanide				

1.3 U²
 J #
 J #
 0.66 U²
 J #
 J # KA 3/9/11
 J #
 J #
 J # KA 3/9/11
 J #
 3.3 U² J #
 J + #
 0.66 U²
 J # KA 3/9/11
 J #
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000176

EPA SAMPLE NO.

MH35G0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768016
 % Solids: 73.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10400			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1350			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	37000			P
7439-92-1	Lead				
7439-95-4	Magnesium	3850			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1310		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	56.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ #
6840 #
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000178

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768017
 % Solids: 26.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5070			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1150	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	341000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2130			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1160	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	77.5	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1900 U *SK*1900 U *SK*1900 U *SK*

2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G1

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768017
% Solids: 26.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.4	J	N	MS
7440-38-2	Arsenic	115.		E	MS
7440-39-3	Barium	80.6		*	MS
7440-41-7	Beryllium	0.29	J	E	MS
7440-43-9	Cadmium	0.45	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.2		*	MS
7440-48-4	Cobalt	2.1		E	MS
7440-50-8	Copper	112.		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	1700			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	540.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.63	J	N	MS
7440-22-4	Silver	4.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.43	J		MS
7440-62-2	Vanadium	96.9		*	MS
7440-66-6	Zinc	177.		*E	MS
57-12-5	Cyanide				

3.80 ~~MS~~
 J ~~MS~~
 J ~~MS~~
 1.90 ~~MS~~
 1.90 ~~MS~~
 H ~~MS~~ ~~KA~~ 2/19/11
 H ~~MS~~
 J ~~MS~~ ~~KA~~ 3/19/11
 J ~~MS~~
 9.5 ~~MS~~ ~~KA~~ J ~~MS~~
 J+ ~~MS~~
 1.90 ~~MS~~ ~~KA~~
 H ~~MS~~ ~~KA~~ 3/19/11
 J ~~MS~~ 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM

Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000180

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G2

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768018
% Solids: 63.9 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6160			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	867.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	57100			P
7439-92-1	Lead				
7439-95-4	Magnesium	2360			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1350.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	100.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ M
782 U M
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000181

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768018
 % Solids: 63.9 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.44	J	N	MS
7440-38-2	Arsenic	24.3		E	MS
7440-39-3	Barium	226.		*	MS
7440-41-7	Beryllium	0.47	J	E	MS
7440-43-9	Cadmium	0.44	J	*NE	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.9		*	MS
7440-48-4	Cobalt	2.9		E	MS
7440-50-8	Copper	47.8		NE	MS
7439-89-6	Iron				
7439-92-1	Lead	304.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	407.		*	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.8		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.0	J	N	MS
7440-22-4	Silver	1.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.80			MS
7440-62-2	Vanadium	56.3		*	MS
7440-66-6	Zinc	131.		*E	MS
57-12-5	Cyanide				

1.6 US #
 J #
 J #
 0.780 #
 0.780 #
 J # KA 3/9/11
 J #
 J # KA 3/9/11
 J #
 3.90 # J #
 J+ #
 J+ # KA 3/9/11
 J # 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000182

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
 Matrix: Soil Lab Sample ID: 1030768019
 % Solids: 78.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7840			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1120			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	33000			P
7439-92-1	Lead				
7439-95-4	Magnesium	6800			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	510.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	25.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

636 U 7A

636 U 72

2/18/11

Color Before: BROWN Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000184

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G4

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35E5
Matrix: Soil Lab Sample ID: 1030768020
% Solids: 61.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6640			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1050			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	81600		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	3090			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1230		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	94.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ JL
813 U JL
7/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

UOS

URS Operating Services, Inc.

Data Validation Report

**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case/TDD No.	Site Name		Operable Unit
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	MH35G5	

Review Assigned Date: December 15, 2010Data Validator: Fred LuckReview Completion Date: February 18, 2011Report Reviewer: Lesley Boyd

Sample ID	Matrix	Analysis
MH35G5	Sediment	CLP -Metals
MH35G6		
MH35G7		
MH35G8		
MH35G9		
MH35H0		
MH35H1		
MH35H2		
MH35H3		
MH35H4		
MH35H5		
MH35H6		
MH35H8		
MH35H9		

Sample ID	Matrix	Analysis
MH35J0	Sediment	CLP -Metals
MH35J1		
MH35J2	Mine Sediment	
MH35J3	Sediment	
MH35J4	Soil - Surface	
MH35J5		

UOS

URS Operating Services, Inc.

Data Validation Report

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
- () Data are UNACCEPTABLE according to EPA Functional Guidelines.
- (X) Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X _____

CLP Project Officer Attention Required? Yes _____ No X _____ If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT

REVIEW NARRATIVE SUMMARY

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, Case No. 40755, SDG No. MH35G5, consisted of twenty sediment / mine sediment / soil -surface samples for metals by ICP-AES and ICP-MS (ISM01.2). The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35G5, MH35G6, MH35G7, MH35G8, MH35G9, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Antimony	U	Blank Contamination.	3
MH35G5, MH35G6, MH35G7, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H8, MH35H9, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Beryllium			
MH35G6, MH35G7, MH35G8, MH35G9, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H8, MH35H9, MH35J1, MH35J2, MH35J3, MH35J5	Cadmium			
MH35G5, MH35G7, MH35G9, MH35H2, MH35H4, MH35H5, MH35H6, MH35J1, MH35J2	Calcium			
MH35H9	Chromium			
MH35G7, MH35G9, MH35H0, MH35H8, MH35H9	Cobalt			
MH35G7, MH35G9, MH35H0, MH35H2, MH35H4, MH35H8, MH35H9, MH35J1, MH35J2	Magnesium			
MH35G7, MH35H0, MH35H8, MH35H9	Nickel			

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35G5, MH35G7, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3	Potassium	U	Blank Contamination	3
MH35G5, MH35G6, MH35G7, MH35G8, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Selenium			
MH35G7, MH35G8, MH35H1, MH35H8, MH35H9, MH35J2, MH35J3	Silver			
MH35G5, MH35G6, MH35G7, MH35G8, MH35G9, MH35H0, MH35H1, MH35H2, MH35H3, MH35H4, MH35H5, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Sodium			
MH35G5, MH35G7, MH35G8, MH35G9, MH35H0, MH35H2, MH35H3, MH35H4, MH35H6, MH35H8, MH35H9, MH35J0, MH35J1, MH35J2, MH35J3, MH35J4, MH35J5	Thallium			
MH35G8, MH35J0	Beryllium	J+	Potentially false positive detection in ICS check sample	4
MH35G6, MH35G8, MH35H5, MH35J4, MH35J5	Potassium			
All Samples	Thallium	UJ	Potentially false negative detection in ICS check sample	7
	Selenium, Zinc	J-/ UJ	MS 30 - 74%R, Post Digestion Spike %R < 75%	
	Antimony, Silver	J/UJ	MS <30%R, Post Digestion Spike %R ≥ 75%	
	Arsenic, Beryllium, Cadmium, Chromium, Copper, Manganese, Nickel, Zinc	J	Serial Dilution %D > 10%	8

1. PRESERVATION AND HOLDING TIMES

All technical holding times and preservation criteria were met.

Yes No

Comments: The samples were analyzed within 180 days for the ICP metals. According to the Sample Log-In Sheet and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. The Sample Log-In Sheet further indicates that neither cooler contained a Cooler Temperature Indicator Bottle, as indicated on the form to be required. There is also no indication that SMO was contacted regarding this issue, neither is any documentation of the resolution or indication of how the cooler temperature was derived provided.

When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

No other shipping or receiving problems were noted. Chain-of-custody, summary forms, and raw data were evaluated.

2. INSTRUMENT CALIBRATIONS: INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICV AND CCV)

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes No

Comments: None.

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes No

Comments: None.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes No

Comments: None.

3. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes X No

Comments: For the ICP-AES analyses, the ICB was rerun.

The continuing calibration blanks were run at 10% frequency.

Yes X No

Comments: Continuing calibration blanks were run every 10 samples.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No

Comments: None.

All analyzed blanks were free of contamination.

Yes No X

Comments: The following table lists the blanks with contamination that resulted in sample qualification, elements present, affected samples, and data qualifiers:

Blank Contaminants

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Antimony	1	0.0097	0.017	MH35G5	0.44	1.3 U
					MH35G6	0.82	1.6 U
					MH35G7	1.1	2.8 U
					MH35G8	0.14	1.3 U
					MH35G9	1.8	3.0 U
					MH35H1	0.46	3.2 U
					MH35H2	0.65	2.7 U
					MH35H3	0.20	1.3 U
					MH35H4	0.74	2.8 U
					MH35H5	0.47	2.2 U
					MH35H6	1.6	2.7 U
					MH35H9	1.2	2.9 U
					MH35J0	0.29	1.7 U
					MH35J1	1.0	3.0 U
					MH35J2	1.7	3.1 U
MH35J3	0.51	3.5 U					
MH35J4	0.94	1.3 U					
MH35J5	0.14	1.2 U					
PB	Beryllium	0.5	0.0032	0.013	MH35G5	0.25	0.63 U
					MH35G6	0.38	0.79 U
					MH35G7	0.13	1.4 U
					MH35G9	0.74	1.5 U
					MH35H0	0.37	1.1 U
					MH35H1	1.1	1.6 U
					MH35H2	0.33	1.4 U
					MH35H3	0.23	0.64 U
					MH35H4	0.41	1.4 U
					MH35H5	0.44	1.1 U
					MH35H6	0.52	1.4 U
					MH35H8	0.26	1.7 U
					MH35H9	1.2	1.5 U
					MH35J1	0.26	1.5 U
					MH35J2	0.13	1.5 U
MH35J3	1.6	1.7 U					
MH35J4	0.48	0.64 U					
MH35J5	0.44	0.60 U					
PB	Cadmium	0.5	0.0027	0.004	MH35G6	0.73	0.79 U
					MH35G7	0.11	1.4 U
					MH35G8	0.42	0.64 U
					MH35G9	1.2	1.5 U
					MH35H1	1.1	1.6 U
					MH35H2	0.58	1.4 U
					MH35H3	0.51	0.64 U
					MH35H4	0.50	1.4 U
					MH35H5	0.70	1.1 U
					MH35H8	0.12	1.7 U
					MH35H9	0.74	1.5 U
					MH35J1	0.28	1.5 U
					MH35J2	1.2	1.5 U
					MH35J3	1.1	1.7 U
					MH35J5	0.11	0.60 U

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Calcium	500	1.7	1.957	MH35G5	195	627 U
					MH35G7	1110	1380 U
					MH35G9	1390	1500 U
					MH35H2	1330	1370 U
					MH35H4	1110	1410 U
					MH35H5	859	1100 U
					MH35H6	1270	1370 U
					MH35J1	1070	1510 U
					MH35J2	729	1530 U
PB	Chromium	1	0.026	0.060	MH35H9	0.62	2.9 U
PB	Cobalt	1	0.0053	0.500	MH35G7	1.4	2.8 U
					MH35G9	2.3	3.0 U
					MH35H0	1.1	2.2 U
					MH35H8	1.1	3.4 U
					MH35H9	0.62	2.9 U
PB	Magnesium	500	1.2	2.721	MH35G7	753	1380 U
					MH35G9	646	1500 U
					MH35H0	791	1120 U
					MH35H2	1150	1370 U
					MH35H4	941	1410 U
					MH35H8	1460	1680 U
					MH35H9	327	1460 U
					MH35J1	1020	1510 U
					MH35J2	1040	1530 U
PB	Nickel	0.5	0.013	0.500	MH35G7	0.99	1.4 U
					MH35H0	1.1	1.1 U
					MH35H8	1.1	1.7 U
					MH35H9	0.59	1.5 U
PB	Potassium	500	5.8	-8.872	MH35G5	606	627 U
					MH35G7	498	1380 U
					MH35G9	514	1500 U
					MH35H0	504	1120 U
					MH35H1	817	1580 U
					MH35H2	729	1370 U
					MH35H3	297	638 U
					MH35H4	730	1410 U
					MH35H6	956	1370 U
					MH35H8	583	1680 U
					MH35H9	268	1460 U
					MH35J0	703	825 U
					MH35J1	1020	1510 U
					MH35J2	373	1530 U
					MH35J3	974	1740 U
PB	Selenium	2.5	0.036	2.500	MH35G5	1.5	3.1 U
					MH35G6	1.8	4.0 U
					MH35G7	0.78	6.9 U
					MH35G8	1.0	3.2 U
					MH35G9	1.0	7.5 U
					MH35H0	0.83	5.6 U
					MH35H1	1.3	7.9 U
					MH35H2	0.83	6.9 U
					MH35H3	0.92	3.2 U
					MH35H4	0.69	7.1 U
					MH35H5	1.6	5.5 U
					MH35H6	1.1	6.9 U

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Selenium	2.5	0.036	2.500	MH35H8	2.4	8.4 U
					MH35H9	0.34	7.3 U
					MH35J0	0.32	4.1 U
					MH35J1	1.5	7.6 U
					MH35J2	0.23	7.6 U
					MH35J3	1.2	8.7 U
					MH35J4	0.85	3.2 U
					MH35J5	0.62	3.0 U
PB	Silver	0.5	0.0023	0.015	MH35G7	0.38	1.4 U
					MH35G8	0.48	0.64 U
					MH35H1	1.4	1.6 U
					MH35H8	0.29	1.7 U
					MH35H9	0.88	1.5 U
					MH35J2	0.84	1.5 U
					MH35J3	0.56	1.7 U
PB	Sodium	500	0.73	17.117	MH35G5	26.2	627 U
					MH35G6	72.1	795 U
					MH35G7	53.5	1380 U
					MH35G8	72.2	640 U
					MH35G9	38.4	1500 U
					MH35H0	33.9	1120 U
					MH35H1	44.5	1580 U
					MH35H2	53.0	1370 U
					MH35H3	20.8	638 U
					MH35H4	73.1	1410 U
					MH35H5	102	1100 U
					MH35H6	78.6	1370 U
					MH35H8	141	1680 U
					MH35H9	28.6	1460 U
					MH35J0	25.2	825 U
					MH35J1	90.9	1510 U
					MH35J2	30.5	1530 U
MH35J3	88.4	1740 U					
MH35J4	77.9	640 U					
MH35J5	81.2	605 U					
PB	Thallium	0.5	0.0015	0.500	MH35G5	0.45	0.63 U
					MH35G6	0.64	0.79 U
					MH35G7	0.12	1.4 U
					MH35G8	0.31	0.64 U
					MH35G9	0.19	1.5 U
					MH35H0	0.11	1.1 U
					MH35H1	0.77	1.6 U
					MH35H2	0.33	1.4 U
					MH35H3	0.23	0.64 U
					MH35H4	0.33	1.4 U
					MH35H5	0.61	1.1 U
					MH35H6	0.41	1.4 U
					MH35H8	0.070	1.7 U
					MH35H9	0.017	1.5 U
					MH35J0	0.39	0.83 U
					MH35J1	0.31	1.5 U
					MH35J2	0.25	1.5 U
MH35J3	0.50	1.7 U					
MH35J4	0.31	0.64 U					
MH35J5	0.33	0.60 U					

4. INDUCTIVELY COUPLED PLASMA - INTERFERENCE CHECK SAMPLE (ICP-ICS)

The ICP interference check sample (ICS) was run at the beginning and end of each sample analysis run and every 20 analytical samples, but not prior to the ICV.

Yes X No

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within \pm the CRQL.

Yes No X

Comments: For Sodium, the ICP-AES Interference Check Sample Results exceeded the True Values by approximately 2.0 times the CRQL, this analysis was repeated with similar results. Results for all samples for Sodium analyses, have already been flagged 'U' due to blank contamination therefore no further qualification is applied due to the ICP-AES ICS result.

Sample results for aluminum, calcium, iron, and magnesium were less than the ICSA values or no interference was noted.

Yes X No NA

Comments: None.

Sample results contain potential false positives and false negatives.

Yes X No

Comments: The following table lists the elements with potential false positives or false negatives that resulted in sample qualification, affected samples, and data qualifiers:

ICP Interferences

Element	Concentration Found in ICSA Sample (ug/L)	Affected Samples	Concentration Found in Sample (mg/kg)	Qualifier/Adjustment
Beryllium	0.36	MH35G8 MH35J0	>MDL	J+
Potassium	494	MH35G6 MH35G8 MH35H5 MH35J4 MH35J5		
Thallium	-0.05	All samples	All concentrations	UJ

5. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No

Comments: None.

All results were within control limits OF 70-130%.

Yes X No

Comments: None.

6. FORM 6 & 12 - DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No NA

Comments: None.

The RPDs were calculated correctly.

Yes X No NA

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were within 20% (limits of 35% apply for soil/sediments/tailings samples).

Yes X No__ NA__

Comments: None.

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of CRQL (absolute difference < CRQL for soils).

Yes X No__ NA__

Comments: None.

7. SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No__ NA__

Comments: None.

The percent recoveries (%Rs) were calculated correctly.

Yes X No__ NA__

Comments: None.

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes__ No X

Comments: The following table lists the spike recoveries outside control limits, post digestion spike recoveries, samples affected, and data qualifiers:

Element	Matrix Spike %R	Post-Digestion %R	Samples Affected	Qualifiers
Antimony	12%	84%	All samples	J/UJ
Selenium	60%	63%		J-/UJ
Silver	6%	85%		J/UJ
Zinc	40%	68%		J-/UJ

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Ag, Hg).

Yes X No NA

Comments: None.

8. ICP SERIAL DILUTION

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes X No

Comments: None.

The serial dilution was without interference problems as defined by the SOW.

Yes No X

Comments: The following serial dilution %Ds were greater than 10% and the original sample result was at least 50* the MDL:

Element	% Difference	Samples Affected	Qualifiers
Arsenic	22%	All samples	J
Beryllium	28%		
Cadmium	13%		
Chromium	12%		
Copper	21%		
Manganese	12%		
Nickel	90%		
Zinc	34%		

9. ICP-MS

The ICP MS tune met SOW requirements.

Yes X No ___ NA ___

Comments: The ICP MS instrument was correctly tuned prior to analysis and all tuning criteria were met.

The minimum number of internal standards were added to the analyses and bracketed the target analyte masses.

Yes X No ___

Comments: None.

All percent relative intensities were within 60-125%.

Yes X No ___

Comments: None.

10. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

Yes ___ No ___ NA X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA/QC.

11. FORM 10 - INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes X No ___

Comments: None.

12. FORM 12 - PREPARATION LOG

Information on the preparation of samples for analysis was reported on Form 12.

Yes X No ___

Comments: None.

13. FORM 13 - ANALYSIS RUN LOG

A Form 13 with the required information was filled out for each analysis run in the data package.

Yes X No

Comments: None.

14. Additional Comments or Problems/Resolutions Not Addressed Above

Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

INORGANIC DATA QUALITY ASSURANCE REVIEW

Region VIII

DATA QUALIFIER DEFINITIONS

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality. Use of additional qualifiers should be carefully considered. Definitions for all qualifiers used should be provided with each report.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." The data are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample.
- J+ - The associated numerical value is an estimated quantity but the result may be biased high.
- J- - The associated numerical value is an estimated quantity but the result may be biased low.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

ACRONYMS

AA	Atomic Absorption
Ag	Silver
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRA	CRQL standard required for AA
CRQL	Contract Required Quantitation Limit
CRI	CRQL standard required for ICP
CV	Cold Vapor
EPA	U.S. Environmental Protection Agency
GFAA	Graphite Furnace Atomic Absorption
Hg	Mercury
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
ICSA	Interference Check Sample (Solution A)
ICSAB	Interference Check Sample (Solution AB)
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LRA	Linear Range Verification Analysis
MDL	Method Detection Limit
PDS	Post Digestion Spike
QC	Quality Control
RPD	Relative Percent Difference
RPM	Regional Project Manager
RSD	Percent Relative Standard Deviation
SA	Spike Added
SAS	Special Analytical Services
SDG	Sample Delivery Group
SOW	Statement of Work
SR	Sample Result
SSR	Spiked Sample Result

000204

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G5

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769001
% Solids: 79.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.44	J	N	MS
7440-38-2	Arsenic	58.9		E	MS
7440-39-3	Barium	144.			MS
7440-41-7	Beryllium	0.25	J	E	MS
7440-43-9	Cadmium	0.77		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.8		E	MS
7440-48-4	Cobalt	4.0			MS
7440-50-8	Copper	64.9		E	MS
7439-89-6	Iron				
7439-92-1	Lead	254.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	406.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.5	J	N	MS
7440-22-4	Silver	0.95		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.45	J		MS
7440-62-2	Vanadium	36.5			MS
7440-66-6	Zinc	192.		NE	MS
57-12-5	Cyanide				

1.30Jⁿ
Jⁿ
0.630Jⁿ
Jⁿ
Jⁿ
Jⁿ
Jⁿ
Jⁿ
3.10Jⁿ
Jⁿ
0.630Jⁿ
Jⁿ
2/18/10

Color Before: BROWN Clarity Before: _____ Texture: COARSE
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000205

EPA SAMPLE NO.

MH35G5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769001
 % Solids: 79.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3730			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	195.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	53500			P
7439-92-1	Lead				
7439-95-4	Magnesium	2030			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	606.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	26.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

62707
62707
62707
2/18/14

Color Before: ORANGE Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000206

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769002
 % Solids: 62.9 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.82	J	N	MS
7440-38-2	Arsenic	44.2		E	MS
7440-39-3	Barium	443.			MS
7440-41-7	Beryllium	0.38	J	E	MS
7440-43-9	Cadmium	0.73	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.6		E	MS
7440-48-4	Cobalt	3.5			MS
7440-50-8	Copper	35.8		E	MS
7439-89-6	Iron				
7439-92-1	Lead	372.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	344.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.7		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.8	J	N	MS
7440-22-4	Silver	2.2		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.64	J		MS
7440-62-2	Vanadium	37.2			MS
7440-66-6	Zinc	179.		NE	MS
57-12-5	Cyanide				

1.60J π
 J π
 0.790J π
 0.790J π
 J π
 J π
 J π
 J π
 4.00J π
 J π
 0.790J π
 J- π
 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000207

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G6

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769002
% Solids: 62.9 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4750			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	854.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	73000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	1890			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1150			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	72.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ M
7950 TL
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000208

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G7

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769005
% Solids: 36.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.1	J	N	MS
7440-38-2	Arsenic	36.7		E	MS
7440-39-3	Barium	30.7			MS
7440-41-7	Beryllium	0.13	J	E	MS
7440-43-9	Cadmium	0.11	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.1		E	MS
7440-48-4	Cobalt	1.4	J		MS
7440-50-8	Copper	113.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	136.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	156.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.99	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.78	J	N	MS
7440-22-4	Silver	0.38	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.12	J		MS
7440-62-2	Vanadium	27.8			MS
7440-66-6	Zinc	44.1		NE	MS
57-12-5	Cyanide				

2.80J π
J π
1.40J π
1.40J π
J π
2.80 π
J π
J π
1.40J π
6.90J π
1.40J π
1.40J π
J- π
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000209

EPA SAMPLE NO.

MH35G7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769005
 % Solids: 36.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2020			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1110			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	397000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	753.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	498.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	53.5	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1380 U π
 1380 U π
 1380 U π
 1380 U π
 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000210

EPA SAMPLE NO.

MH35G8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769006
 % Solids: 78.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.14	J	N	MS
7440-38-2	Arsenic	11.6		E	MS
7440-39-3	Barium	78.8			MS
7440-41-7	Beryllium	0.66		E	MS
7440-43-9	Cadmium	0.42	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.2		E	MS
7440-48-4	Cobalt	6.5			MS
7440-50-8	Copper	65.0		E	MS
7439-89-6	Iron				
7439-92-1	Lead	145.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	839.		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	4.2		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.0	J	N	MS
7440-22-4	Silver	0.48	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.31	J		MS
7440-62-2	Vanadium	52.2			MS
7440-66-6	Zinc	145.		NE	MS
57-12-5	Cyanide				

1.30UJ π
 J π
 J+ π
 0.64UJ π
 J π
 J π
 J π
 J π
 3.2UJ π
 0.64UJ π
 0.64UJ π
 J- π
 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000211

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769006
 % Solids: 78.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8370			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1230			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	34800			P
7439-92-1	Lead				
7439-95-4	Magnesium	1460			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	902.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	72.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ 7k
6400 7k
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000212

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35G9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769007
 % Solids: 33.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.8	J	N	MS
7440-38-2	Arsenic	24.5		E	MS
7440-39-3	Barium	36.1			MS
7440-41-7	Beryllium	0.74	J	E	MS
7440-43-9	Cadmium	1.2	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.1		E	MS
7440-48-4	Cobalt	2.3			MS
7440-50-8	Copper	147.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	773.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	489.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.0		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.0	J	N	MS
7440-22-4	Silver	8.5		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.19	J		MS
7440-62-2	Vanadium	34.0			MS
7440-66-6	Zinc	465.		NE	MS
57-12-5	Cyanide				

3.00J π
J π
1.50J π
1.50J π
J π
3.00 π
J π
J π
J π
7.50J π
J π
1.50J π
J- π
2/18/10

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000213

EPA SAMPLE NO.

MH35G9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769007
 % Solids: 33.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3850			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1390			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	218000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	646.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	514.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	38.4	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1500 U th
 1500 U th
 1500 U th
 1500 U th
 2/18/12

Color Before: RED Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000214

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769008
 % Solids: 44.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	2.3		N	MS
7440-38-2	Arsenic	23.2		E	MS
7440-39-3	Barium	46.5			MS
7440-41-7	Beryllium	0.37	J	E	MS
7440-43-9	Cadmium	2.4		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.0		E	MS
7440-48-4	Cobalt	1.1	J		MS
7440-50-8	Copper	112.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	457.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	239.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.1		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.83	J	N	MS
7440-22-4	Silver	3.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.11	J		MS
7440-62-2	Vanadium	31.7			MS
7440-66-6	Zinc	1040		DNE	MS
57-12-5	Cyanide				

J M
J M
1.1 UJ M
J M
J M
2.2 U M
J M
J M
J M
1.1 UJ M
5.6 UJ M
J M
1.1 UJ M
J- M
2/18/11

Color Before: RED Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000215

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769008
 % Solids: 44.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4670			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1130			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	442000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	791.			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	504.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	33.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1120.0 μ 1120.0 μ 1120.0 μ

2/18/11

Color Before: RED Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000216

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769009
 % Solids: 31.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.46	J	N	MS
7440-38-2	Arsenic	57.5		E	MS
7440-39-3	Barium	200.			MS
7440-41-7	Beryllium	1.1	J	E	MS
7440-43-9	Cadmium	1.1	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	11.9		E	MS
7440-48-4	Cobalt	23.7			MS
7440-50-8	Copper	250.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	1460		D	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	2360		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	12.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.3	J	N	MS
7440-22-4	Silver	1.4	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.77	J		MS
7440-62-2	Vanadium	62.0			MS
7440-66-6	Zinc	378.		NE	MS
57-12-5	Cyanide				

3.20J π
 J π
 1.60J π
 1.60J π
 J π
 J π
 J π
 J π
 J π
 7.90J π
 1.60J π
 1.60J π
 J- π
 2/18/11

Color Before: BLACK Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000217

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H1

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769009
% Solids: 31.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8140			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1940			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	65400			P
7439-92-1	Lead				
7439-95-4	Magnesium	2260			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	817.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	44.5	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

15800 ^{PK}
15800 ^{PK}
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000218

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H2

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769010
% Solids: 36.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.65	J	N	MS
7440-38-2	Arsenic	15.2		E	MS
7440-39-3	Barium	71.6			MS
7440-41-7	Beryllium	0.33	J	E	MS
7440-43-9	Cadmium	0.58	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.4		E	MS
7440-48-4	Cobalt	6.8			MS
7440-50-8	Copper	124.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	341.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	2010		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.2		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.83	J	N	MS
7440-22-4	Silver	4.0		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.33	J		MS
7440-62-2	Vanadium	27.3			MS
7440-66-6	Zinc	242.		NE	MS
57-12-5	Cyanide				

2.70J ⁿ
J ⁿ
1.40J ⁿ
1.40J ⁿ
J ⁿ
J ⁿ
J ⁿ
J ⁿ
J ⁿ
6.90J ⁿ
J ⁿ
1.40J ⁿ
J- ⁿ
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000219

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H2

Lab Name: ALS Laboratory Group Contract: EPW09036

Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5

Matrix: Soil Lab Sample ID: 1030769010

% Solids: 36.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4940			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1330			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	159000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	1150			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	729.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	53.0	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1370 U μ

1370 U μ

1370 U μ

1370 U μ

2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000220

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H3

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769011
% Solids: 78.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.20	J	N	MS
7440-38-2	Arsenic	26.2		E	MS
7440-39-3	Barium	51.8			MS
7440-41-7	Beryllium	0.23	J	E	MS
7440-43-9	Cadmium	0.51	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	9.1		E	MS
7440-48-4	Cobalt	4.3			MS
7440-50-8	Copper	42.8		E	MS
7439-89-6	Iron				
7439-92-1	Lead	294.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	624.		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	4.1		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.92	J	N	MS
7440-22-4	Silver	0.88		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.23	J		MS
7440-62-2	Vanadium	29.1			MS
7440-66-6	Zinc	145.		NE	MS
57-12-5	Cyanide				

1.30J M
J M
0.640J M
0.640J M
J M
J M
J M
3.20J M
J M
0.640J M
J M
2/18/10

Color Before: YELLOW Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000221

EPA SAMPLE NO.

MH35H3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769011
 % Solids: 78.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9330			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1710			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	18200			P
7439-92-1	Lead				
7439-95-4	Magnesium	8680			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	297.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	20.8	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

638 U TH
638 U TH
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

.. 000222

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769012
 % Solids: 35.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.74	J	N	MS
7440-38-2	Arsenic	20.5		E	MS
7440-39-3	Barium	61.9			MS
7440-41-7	Beryllium	0.41	J	E	MS
7440-43-9	Cadmium	0.50	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.3		E	MS
7440-48-4	Cobalt	6.0			MS
7440-50-8	Copper	84.0		E	MS
7439-89-6	Iron				
7439-92-1	Lead	362.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1910		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.6		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.69	J	N	MS
7440-22-4	Silver	2.3		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.33	J		MS
7440-62-2	Vanadium	29.7			MS
7440-66-6	Zinc	240.		NE	MS
57-12-5	Cyanide				

2.80J^M
 J^M
 1.40J^M
 1.40J^M
 J^M
 J^M
 J^M
 J^M
 7.10J^M
 J^M
 1.40J^M
 J^M
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000223

EPA SAMPLE NO.

MH35H4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769012
 % Solids: 35.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4520			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1110			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	203000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	941.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	730.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	73.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1410 U^π
1410 U^π
1410 U^π
1410 U^π
2/18/11

Color Before: RED Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

. - 000224

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H5

Lab Name: ALS Laboratory Group Contract: EPW09036

Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5

Matrix: Soil Lab Sample ID: 1030769013

% Solids: 45.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.47	J	N	MS
7440-38-2	Arsenic	20.3		E	MS
7440-39-3	Barium	142.			MS
7440-41-7	Beryllium	0.44	J	E	MS
7440-43-9	Cadmium	0.70	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	6.4		E	MS
7440-48-4	Cobalt	3.2			MS
7440-50-8	Copper	80.7		E	MS
7439-89-6	Iron				
7439-92-1	Lead	875.		D	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	659.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.6	J	N	MS
7440-22-4	Silver	2.3		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.61	J		MS
7440-62-2	Vanadium	62.0			MS
7440-66-6	Zinc	206.		NE	MS
57-12-5	Cyanide				

2.2 UJ π
 J π
 1.1 UJ π
 1.1 UJ π
 J π
 J π
 J π
 J π
 5.5 UJ π
 J π
 1.1 UJ π
 J- π
 2/18/u

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM

Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000225

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H5

Lab Name: ALS Laboratory Group Contract: EPW09036

Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5

Matrix: Soil Lab Sample ID: 1030769013

% Solids: 45.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6730			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	859.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	144000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2820			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1250			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	102.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1100 u π

J+ π

1100 u π
2/18/u

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000226

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769014
 % Solids: 36.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.6	J	N	MS
7440-38-2	Arsenic	35.6		E	MS
7440-39-3	Barium	85.9			MS
7440-41-7	Beryllium	0.52	J	E	MS
7440-43-9	Cadmium	2.7		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	8.0		E	MS
7440-48-4	Cobalt	4.7			MS
7440-50-8	Copper	212.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	2050		D	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1300		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.5		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.1	J	N	MS
7440-22-4	Silver	5.0		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.41	J		MS
7440-62-2	Vanadium	37.2			MS
7440-66-6	Zinc	628.		NE	MS
57-12-5	Cyanide				

2.70J π
 J π
 1.40J π
 J π
 J π
 J π
 J π
 J π
 J π
 6.90J π
 J π
 1.40J π
 J π
 2/18/K

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000227

EPA SAMPLE NO.

MH35H6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769014
 % Solids: 36.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5750			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1270			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	266000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	2370			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	956.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	78.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1370 U π
 1370 U π
 1370 U π
 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000228

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769015
 % Solids: 29.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	5.6		N	MS
7440-38-2	Arsenic	126.		E	MS
7440-39-3	Barium	21.4			MS
7440-41-7	Beryllium	0.26	J	E	MS
7440-43-9	Cadmium	0.12	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	7.4		E	MS
7440-48-4	Cobalt	1.1	J		MS
7440-50-8	Copper	369.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	59.4			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	130.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.1	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.4	J	N	MS
7440-22-4	Silver	0.29	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.070	J		MS
7440-62-2	Vanadium	88.0			MS
7440-66-6	Zinc	63.3		NE	MS
57-12-5	Cyanide				

J M
J M
1.7 UJ M
1.7 UJ M
J M
3.4 U M
J M
J M
J M
1.7 UJ M
8.4 UJ M
1.7 UJ M
1.7 UJ M
J- M
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000229

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H8

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769015
% Solids: 29.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4960			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1820			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	519000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	1460			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	583.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	141.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1680 U^M
1680 U^H
1680 U^H
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: COARSE
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000230

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H9

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769016
% Solids: 34.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.2	J	N	MS
7440-38-2	Arsenic	43.9		E	MS
7440-39-3	Barium	3.5	J		MS
7440-41-7	Beryllium	1.2	J	E	MS
7440-43-9	Cadmium	0.74	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	0.62	J	E	MS
7440-48-4	Cobalt	0.62	J		MS
7440-50-8	Copper	11.0		E	MS
7439-89-6	Iron				
7439-92-1	Lead	1740		D	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	107.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.59	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.34	J	N	MS
7440-22-4	Silver	0.88	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.017	J		MS
7440-62-2	Vanadium	12.4			MS
7440-66-6	Zinc	361.		NE	MS
57-12-5	Cyanide				

2.9 UJ π
J π
1.5 UJ π
1.5 UJ π
2.9 UJ π
2.9 U π
J π
J π
1.5 UJ π
7.3 UJ π
1.5 UJ π
1.5 UJ π
J- π
2/18/11

Color Before: RED Clarity Before: _____ Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000231

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769016
 % Solids: 34.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3170			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1490			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	445000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	327.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	268.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	28.6	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1460 U ^{TK}1460 U ^{TK}1460 U ^{TK}

2/18/10

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000232

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J0

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769017
% Solids: 60.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.29	J	N	MS
7440-38-2	Arsenic	33.3		E	MS
7440-39-3	Barium	92.7			MS
7440-41-7	Beryllium	1.1		E	MS
7440-43-9	Cadmium	1.3		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	7.6		E	MS
7440-48-4	Cobalt	16.5			MS
7440-50-8	Copper	209.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	711.		D	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	4130		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	8.0		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.32	J	N	MS
7440-22-4	Silver	2.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.39	J		MS
7440-62-2	Vanadium	64.1			MS
7440-66-6	Zinc	289.		NE	MS
57-12-5	Cyanide				

1.70 J ~
J ~
J + ~
J ~
I ~
J ~
I ~
J ~
I ~
J ~
J ~
4.10 J ~
J ~
0.830 J ~
J ~
2/18/10

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000233

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J0

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
Matrix: Soil Lab Sample ID: 1030769017
% Solids: 60.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13700			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1660			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	37300			P
7439-92-1	Lead				
7439-95-4	Magnesium	8730			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	703.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	25.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

825 u^π
825 u^π
2/18/10

Color Before: BROWN Clarity Before: _____ Texture: COARSE
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000234

EPA SAMPLE NO.

MH35J1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769018
 % Solids: 33.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.0	J	N	MS
7440-38-2	Arsenic	49.8		E	MS
7440-39-3	Barium	75.6			MS
7440-41-7	Beryllium	0.26	J	E	MS
7440-43-9	Cadmium	0.28	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	7.1		E	MS
7440-48-4	Cobalt	3.9			MS
7440-50-8	Copper	96.7		E	MS
7439-89-6	Iron				
7439-92-1	Lead	421.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	618.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.6		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.5	J	N	MS
7440-22-4	Silver	2.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.31	J		MS
7440-62-2	Vanadium	43.1			MS
7440-66-6	Zinc	98.1		NE	MS
57-12-5	Cyanide				

3.0 UJ π
 J π
 1.5 UJ π
 1.5 UJ π
 J π
 J π
 J π
 J π
 7.6 UJ π
 J π
 1.5 UJ π
 J- π
 2/18/10

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000235

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769018
 % Solids: 33.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3240			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1070	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	300000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	1210	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1020	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	90.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1510 U π 1510 U π 1510 U π 1510 U π

2/18/10

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000236

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769019
 % Solids: 32.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.7	J	N	MS
7440-38-2	Arsenic	49.1		E	MS
7440-39-3	Barium	41.3			MS
7440-41-7	Beryllium	0.13	J	E	MS
7440-43-9	Cadmium	1.0	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	2.2	J	E	MS
7440-48-4	Cobalt	16.6			MS
7440-50-8	Copper	32.8		E	MS
7439-89-6	Iron				
7439-92-1	Lead	419.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	2110		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.7		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.23	J	N	MS
7440-22-4	Silver	0.84	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.25	J		MS
7440-62-2	Vanadium	12.0			MS
7440-66-6	Zinc	232.		NE	MS
57-12-5	Cyanide				

3.1 UJ π
 J π
 1.5 UJ π
 1.5 UJ π
 J π
 J π
 J π
 J π
 7.6 UJ π
 1.5 UJ π
 1.5 UJ π
 J- π
 2/18/ π

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUMColor After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000237

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769019
 % Solids: 32.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2320			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	729.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	462000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	1040	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	373.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	30.5	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1530 U ^{TK}1530 U ^{TK}1530 U ^{TK}1530 U ^{TK}

2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000238

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769020
 % Solids: 28.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.51	J	N	MS
7440-38-2	Arsenic	26.7		E	MS
7440-39-3	Barium	159.			MS
7440-41-7	Beryllium	1.6	J	E	MS
7440-43-9	Cadmium	1.0	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	5.1		E	MS
7440-48-4	Cobalt	18.6			MS
7440-50-8	Copper	216.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	210.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	897.		E	MS
7439-97-6	Mercury				
7440-02-0	Nickel	6.0		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.2	J	N	MS
7440-22-4	Silver	0.56	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.50	J		MS
7440-62-2	Vanadium	31.3			MS
7440-66-6	Zinc	339.		NE	MS
57-12-5	Cyanide				

3.50J π
 J π
 1.70J π
 1.70J π
 J π
 J π
 I π
 J π
 8.70J π
 1.70J π
 1.70J π
 J- π
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000239

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769020
 % Solids: 28.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	28200			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1950			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	62200			P
7439-92-1	Lead				
7439-95-4	Magnesium	2280			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	974.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	88.4	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1740 U JK

1740 U JK
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000240

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769021
 % Solids: 78.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.94	J	N	MS
7440-38-2	Arsenic	23.7		E	MS
7440-39-3	Barium	117.			MS
7440-41-7	Beryllium	0.48	J	E	MS
7440-43-9	Cadmium	9.6		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	8.4		E	MS
7440-48-4	Cobalt	8.0			MS
7440-50-8	Copper	244.		E	MS
7439-89-6	Iron				
7439-92-1	Lead	1820		D	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1180		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	5.8		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.85	J	N	MS
7440-22-4	Silver	5.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.31	J		MS
7440-62-2	Vanadium	53.6			MS
7440-66-6	Zinc	2610		DNE	MS
57-12-5	Cyanide				

1.3 UJ π
 J π
 0.64 UJ π
 J π
 J π
 J π
 J π
 J π
 J π
 3.2 UJ π
 J π
 0.64 UJ π
 J- π
 2/18/11

Color Before: YELLOW Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000241

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769021
 % Solids: 78.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13900			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	5910			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	47800			P
7439-92-1	Lead				
7439-95-4	Magnesium	11200			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1070			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	77.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ 7
640 U 7
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000242

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769022
 % Solids: 82.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.14	J	N	MS
7440-38-2	Arsenic	13.5		E	MS
7440-39-3	Barium	113.			MS
7440-41-7	Beryllium	0.44	J	E	MS
7440-43-9	Cadmium	0.11	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	10.		E	MS
7440-48-4	Cobalt	6.8			MS
7440-50-8	Copper	40.6		E	MS
7439-89-6	Iron				
7439-92-1	Lead	241.			MS
7439-95-4	Magnesium				
7439-96-5	Manganese	796.		DE	MS
7439-97-6	Mercury				
7440-02-0	Nickel	6.6		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.62	J	N	MS
7440-22-4	Silver	1.3		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.33	J		MS
7440-62-2	Vanadium	65.3			MS
7440-66-6	Zinc	102.		NE	MS
57-12-5	Cyanide				

1.2 UJ ⁿ
 J ⁿ
 0.60 UJ ⁿ
 0.60 UJ ⁿ
 J ⁿ
 J ⁿ
 J ⁿ
 J ⁿ
 3.0 UJ ⁿ
 J ⁿ
 0.60 UJ ⁿ
 J- ⁿ
 2/18/n

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: WHITE Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000243

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35G5
 Matrix: Soil Lab Sample ID: 1030769022
 % Solids: 82.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12900			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2080			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	36900			P
7439-92-1	Lead				
7439-95-4	Magnesium	10700			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1030			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	81.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ K
605 U K
2/18/10

Color Before: BROWN Clarity Before: _____ Texture: COARSEColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case/EDD No.	Site Name		Operable Unit
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	MH35H7	

Review Assigned Date: December 15, 2010 Data Validator: Fred Luck
 Review Completion Date: February 18, 2011 Report Reviewer: Lesley Boyd

Sample ID	Matrix	Analysis
MH35H7	Sediment	CLP -Metals
MH35J6	Soil - Surface	
MH35J7		
MH35J8		
MH35J9		
MH35K0		
MH35K1		
MH35K2		
MH35K3		
MH35K4		
MH35K5		
MH35K6		
MH35K7		

Sample ID	Matrix	Analysis
MH35K8	Sediment	CLP -Metals
MH35K9		
MH35L0		
MH35L1		
MH35L2		
MH35L3		

UOS

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Data Validation Report

DATA QUALITY STATEMENT

- Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
- Data are UNACCEPTABLE according to EPA Functional Guidelines.
- Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X

CLP Project Officer Attention Required? Yes _____ No X If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT

REVIEW NARRATIVE SUMMARY

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, Case No. 40755, SDG No. MH35H7, consisted of nineteen sediment / soil – Surface samples for metals by ICP-AES and ICP-MS (ISM01.2). The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35H7, MH35J7, MH35K1, MH35K2, MH35K4, MH35K5, MH35K7, MH35K8, MH35K9, MH35L1, MH35L2	Antimony	U	Blank Contamination	3
MH35H7, MH35J6, MH35J7, MH35J8, MH35J9, MH35K0, MH35K1, MH35K2, MH35K3, MH35K4, MH35K5, MH35K6, MH35K9, MH35L3	Beryllium			
MH35H7, MH35J7, MH35K2, MH35K5, MH35K9, MH35L3	Cadmium			
MH35J7, MH35J8, MH35J9, MH35K0, MH35K3, MH35K5, MH35K6, MH35K9, MH35L0, MH35L3	Calcium			
MH35K0, MH35K3, MH35K5	Chromium			
MH35J8, MH35J9, MH35K0, MH35K3, MH35K5, MH35L3	Cobalt			
MH35J7, MH35J8, MH35J9, MH35K0, MH35K3, MH35K5, MH35K9, MH35L3	Magnesium			
MH35J8, MH35J9, MH35K0, MH35K3, MH35K5, MH35L3	Nickel			
MH35J7, MH35J8, MH35K8, MH35K9, MH35L0, MH35L3	Potassium			
MH35H7, MH35J6, MH35J7, MH35J8, MH35J9, MH35K0, MH35K1, MH35K2, MH35K4, MH35K5, MH35K6, MH35K7, MH35K8, MH35K9, MH35L0, MH35L1, MH35L2, MH35L3	Selenium			
MH35H7	Silver			

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH35H7, MH35J6, MH35J7, MH35J8, MH35J9, MH35K0, MH35K1, MH35K2, MH35K3, MH35K4, MH35K5, MH35K6, MH35K7, MH35K8, MH35K9, MH35L0, MH35L1, MH35L2, MH35L3	Sodium	U	Blank Contamination	3
MH35K7, MH35K8, MH35L0, MH35L1, MH35L2	Beryllium	J+	Potentially false positive detection in ICS check sample	4
MH35H7, MH35J6, MH35J9, MH35K0, MH35K1, MH35K2, MH35K3, MH35K4, MH35K5, MH35K6, MH35K7, MH35L1, MH35L2	Potassium			
MH35J7, MH35J8, MH35K2, MH35K4, MH35K5, MH35K6, MH35K8, MH35K9, MH35L2, MH35L3	Thallium	J-	Potentially false negative detection in ICS check sample	
All Samples	Copper, Lead	J/UJ	Original & Duplicate both >5x the CRQL and RPD > 20%	6
	Antimony, Silver	J/UJ	MS <30%R, Post Digestion Spike %R ≥ 75%	7
	Barium, Copper	J+	MS >125%R, Post Digestion Spike not performed	
	Arsenic		MS > 125%R, Post Digestion Spike %R > 125%	
	Arsenic, Beryllium, Cadmium, Copper, Nickel, Sodium, Zinc	J/UJ	Serial Dilution %D > 10%	8

1. PRESERVATION AND HOLDING TIMES

All technical holding times and preservation criteria were met.

Yes No

Comments: The samples were analyzed within 180 days for the ICP metals. According to the Sample Log-In Sheet and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. The Sample Log-In Sheet further indicates that neither cooler contained a Cooler Temperature Indicator Bottle, as indicated on the form to be required. There is also no indication that SMO was contacted regarding this issue, neither is any documentation of the resolution or indication of how the cooler temperature was derived provided. The TR/COC also did not designate a sample for laboratory QC, but the documentation of the resolution of this issue is provided in the SDG.

When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

No other shipping or receiving problems were noted. Chain-of-custody, summary forms, and raw data were evaluated.

2. INSTRUMENT CALIBRATIONS: INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICV AND CCV)

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes No

Comments: None.

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes No

Comments: None.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes No

Comments: None.

3. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes X No

Comments: None.

The continuing calibration blanks were run at 10% frequency.

Yes X No

Comments: Continuing calibration blanks were run every 10 samples.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No

Comments: None.

All analyzed blanks were free of contamination.

Yes No X

Comments: The following table lists the blanks with contamination that resulted in sample qualification, elements present, affected samples, and data qualifiers:

Blank Contaminants

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Antimony	1	0.0097	0.026	MH35H7	0.19	1.5 U
					MH35J7	1.2	1.3 U
					MH35K1	0.26	1.1 U
					MH35K2	0.25	1.1 U
					MH35K4	0.54	1.1 U
					MH35K5	0.99	1.1 U
					MH35K7	0.41	1.2 U
					MH35K8	0.59	1.3 U
					MH35K9	5.2	6.8 U
					MH35L1	0.71	1.7 U
					MH35L2	0.34	1.2 U
PB	Beryllium	0.5	0.0032	0.013	MH35H7	0.68	0.76 U
					MH35J6	0.19	0.60 U
					MH35J7	0.22	0.65 U
					MH35J8	0.16	0.78 U
					MH35J9	0.21	0.56 U
					MH35K0	0.32	0.55 U
					MH35K1	0.30	0.57 U
					MH35K2	0.20	0.55 U
					MH35K3	0.11	0.54 U
					MH35K4	0.35	0.54 U
					MH35K5	0.13	0.55 U
					MH35K6	0.19	0.55 U
					MH35K9	0.84	3.4 U
					MH35L3	0.11	3.0 U
PB	Cadmium	0.5	0.0027	0.005	MH35H7	0.25	0.76 U
					MH35J7	0.58	0.65 U
					MH35K2	0.55	0.55 U
					MH35K5	0.53	0.55 U
					MH35K9	1.7	3.4 U
					MH35L3	2.8	3.0 U
PB	Calcium	500	1.7	9.992	MH35J7	369	648 U
					MH35J8	405	775 U
					MH35J9	57.7	563 U
					MH35K0	259	551 U
					MH35K3	34.8	535 U
					MH35K5	48.6	554 U
					MH35K6	246	547 U
					MH35K9	2040	3380 U
					MH35L0	223	718 U
					MH35L3	279	2980 U
PB	Chromium	1	0.026	1.000	MH35K0	0.97	1.1 U
					MH35K3	0.86	1.1 U
					MH35K5	0.46	1.1 U
PB	Cobalt	1	0.0053	0.006	MH35J8	0.41	0.78 U
					MH35J9	0.19	0.56 U
					MH35K0	0.23	0.55 U
					MH35K3	0.35	0.54 U
					MH35K5	0.12	0.55 U
					MH35L3	1.4	3.0 U

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Magnesium	500	1.2	2.971	MH35J7 MH35J8 MH35J9 MH35K0 MH35K3 MH35K5 MH35K9 MH35L3	477 375 45.9 72.4 38.2 118 2120 486	648 U 775 U 563 U 551 U 535 U 554 U 3380 U 2980 U
PB	Nickel	0.5	0.013	0.500	MH35J8 MH35J9 MH35K0 MH35K3 MH35K5 MH35L3	0.36 0.19 0.17 0.27 0.14 1.6	0.78 U 0.56 U 0.55 U 0.54 U 0.55 U 3.0 U
PB	Potassium	500	5.8	21.198	MH35J7 MH35J8 MH35K8 MH35K9 MH35L0 MH35L3	319 418 645 1130 307 773	648 U 775 U 664 U 3380 U 718 U 2980 U
PB	Selenium	2.5	0.036	2.500	MH35H7 MH35J6 MH35J7 MH35J8 MH35J9 MH35K0 MH35K1 MH35K2 MH35K4 MH35K5 MH35K6 MH35K7 MH35K8 MH35K9 MH35L0 MH35L1 MH35L2 MH35L3	1.1 2.7 1.2 1.4 1.7 1.8 1.3 0.60 0.83 0.90 1.3 0.52 0.35 2.0 0.66 0.59 0.59 4.2	3.8 U 3.0 U 3.2 U 3.9 U 2.8 U 2.8 U 2.8 U 2.8 U 2.7 U 2.8 U 2.7 U 3.0 U 3.3 U 17 U 3.6 U 4.3 U 3.0 U 15 U
PB	Silver	0.5	0.0023	0.004	MH35H7	0.41	0.76 U
PB	Sodium	500	0.73	12.529	MH35H7 MH35J6 MH35J7 MH35J8 MH35J9 MH35K0 MH35K1 MH35K2 MH35K3 MH35K4 MH35K5 MH35K6	80.1 77.4 38.8 43.9 22.3 59.0 37.7 105 53.9 64.3 53.1 70.9	761 U 604 U 648 U 775 U 563 U 551 U 569 U 552 U 535 U 541 U 554 U 547 U

Blank ID	Contaminant	CRQL (mg/Kg)	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Sodium	500	0.73	12.529	MH35K7	59.2	597 U
					MH35K8	22.1	664 U
					MH35K9	139	3380 U
					MH35L0	23.0	718 U
					MH35L1	44.3	855 U
					MH35L2	16.7	600 U
					MH35L3	48.1	2980 U

4. INDUCTIVELY COUPLED PLASMA - INTERFERENCE CHECK SAMPLE (ICP-ICS)

The ICP interference check sample (ICS) was run at the beginning and end of each sample analysis run and every 20 analytical samples, but not prior to the ICV.

Yes X No

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within \pm the CRQL.

Yes X No

Comments: None.

Sample results for aluminum, calcium, iron, and magnesium were less than the ICSA values or no interference was noted.

Yes X No NA

Comments: None.

Sample results contain potential false positives and false negatives.

Yes X No

Comments: The following table lists the elements with potential false positives or false negatives that resulted in sample qualification, affected samples, and data qualifiers:

ICP Interferences

Element	Concentration Found in ICSA Sample (ug/L)	Affected Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
Beryllium	0.36	MH35K7 MH35K8 MH35L0 MH35L1 MH35L2	>MDL	J+
Potassium	494	MH35H7 MH35J6 MH35J9 MH35K0 MH35K1 MH35K2 MH35K3 MH35K4 MH35K5 MH35K6 MH35K7 MH35L1 MH35L2		
Thallium	-0.05	MH35J7 MH35J8 MH35K2 MH35K4 MH35K5 MH35K6 MH35K8 MH35K9 MH35L2 MH35L3	0.23 0.10 0.36 0.38 0.43 0.37 0.41 0.31 0.44 0.19	J-

5. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No

Comments: None.

All results were within control limits OF 70-130%.

Yes X No

Comments: None.

UOS

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Data Validation Report

6. FORM 6 & 12 - DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No NA

Comments: None.

The RPDs were calculated correctly.

Yes No NA

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were within $\pm 20\%$ (limits of $\pm 35\%$ apply for soil/sediments/tailings samples).

Yes No NA

Comments: The following table lists the duplicate results outside control limits, samples affected, and data qualifiers:

Element	RPD	QC Limit	Samples Affected	Qualifiers
Copper	43%	20%	All samples	J / UJ
Lead	71%			

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of CRQL (absolute difference < CRQL for soils).

Yes No NA

Comments: None.

7. SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No NA

Comments: None.

The percent recoveries (%Rs) were calculated correctly.

Yes X No ___ NA ___

Comments: None.

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes X No X

Comments: The following table lists the spike recoveries outside control limits, post digestion spike recoveries, samples affected, and data qualifiers:

Element	Matrix Spike %R	Post-Digestion %R	Samples Affected	Qualifiers
Antimony	17%	85%	All samples	J/UJ
Arsenic	130%	944%		J+
Barium	128%	NA		
Copper	134%	NA		
Silver	11%	88%		J/UJ

NA – No Post digest spike analyzed

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Ag, Hg).

Yes ___ No X NA ___

Comments: For Arsenic and Copper the spike recoveries were outside of the Control Limits, but no Post-Digest Spike was performed.

8. ICP SERIAL DILUTION

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes X No ___

Comments: None.

The serial dilution was without interference problems as defined by the SOW.

Yes No

Comments: The following serial dilution %Ds were greater than 10% and the original sample result was at least 50* the MDL:

Element	% Difference	Samples Affected	Qualifiers
Arsenic	21%	All samples	J
Beryllium	19%		
Cadmium	22%		
Copper	14%		
Nickel	15%		
Sodium	53%		
Zinc	29%		

9. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

Yes No NA

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

10. FORM 10 - INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes No

Comments: None.

11. FORM 12 - PREPARATION LOG

Information on the preparation of samples for analysis was reported on Form 12.

Yes No

Comments: None.

12. FORM 13 - ANALYSIS RUN LOG

A Form 13 with the required information was filled out for each analysis run in the data package.

Yes X No

Comments: None.

13. Additional Comments or Problems/Resolutions Not Addressed Above

Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

INORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality. Use of additional qualifiers should be carefully considered. Definitions for all qualifiers used should be provided with each report.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." The data are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample.
- J+ - The associated numerical value is an estimated quantity but the result may be biased high.
- J- - The associated numerical value is an estimated quantity but the result may be biased low.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

ACRONYMS

AA	Atomic Absorption
Ag	Silver
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRA	CRQL standard required for AA
CRQL	Contract Required Quantitation Limit
CRI	CRQL standard required for ICP
CV	Cold Vapor
EPA	U.S. Environmental Protection Agency
GFAA	Graphite Furnace Atomic Absorption
Hg	Mercury
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma

ICS	Interference Check Sample
ICSA	Interference Check Sample (Solution A)
ICSAB	Interference Check Sample (Solution AB)
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LRA	Linear Range Verification Analysis
MDL	Method Detection Limit
PDS	Post Digestion Spike
QC	Quality Control
RPD	Relative Percent Difference
RPM	Regional Project Manager
RSD	Percent Relative Standard Deviation
SA	Spike Added
SAS	Special Analytical Services
SDG	Sample Delivery Group
SOW	Statement of Work
SR	Sample Result
SSR	Spiked Sample Result

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000261

EPA SAMPLE NO.

MH35H7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770001
 % Solids: 65.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5550			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1500			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	30000			P
7439-92-1	Lead				
7439-95-4	Magnesium	2560			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	934.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	80.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ K
761 UJ #
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000262

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35H7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770001
 % Solids: 65.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.19	J	N	MS
7440-38-2	Arsenic	11.7		NE	MS
7440-39-3	Barium	190.		N	MS
7440-41-7	Beryllium	0.68	J	E	MS
7440-43-9	Cadmium	0.25	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.8			MS
7440-48-4	Cobalt	4.3		*	MS
7440-50-8	Copper	34.5		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	72.5		*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	568.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.1	J		MS
7440-22-4	Silver	0.41	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.52	J		MS
7440-62-2	Vanadium	45.2			MS
7440-66-6	Zinc	99.0		*E	MS
57-12-5	Cyanide				

1.50 π
 J+ π
 J+ π
 0.760 J π
 0.760 J π
 J ~~KA~~ π
 J+ π
 J π
 J π
 3.80 π
 0.760 J π
 J ~~KA~~ π
 J π
 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: GRAY Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000263

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770004
 % Solids: 82.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8780			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1780			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	102000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	5600			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	790.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	77.4	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ JK
604 UJ JK
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000264

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770004
 % Solids: 82.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.8		N	MS
7440-38-2	Arsenic	9.1		NE	MS
7440-39-3	Barium	105.		N	MS
7440-41-7	Beryllium	0.19	J	E	MS
7440-43-9	Cadmium	0.63		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	4.9			MS
7440-48-4	Cobalt	1.3		*	MS
7440-50-8	Copper	195.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	6440		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	452.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	2.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.7	J		MS
7440-22-4	Silver	103.		DN	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.50	J		MS
7440-62-2	Vanadium	26.0			MS
7440-66-6	Zinc	167.		*E	MS
57-12-5	Cyanide				

J
J+
J+
0.60 UJ
J
J+
J
J
J
3.00
J
J
K₂A
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: BROWN Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000265

EPA SAMPLE NO.

MH35J7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770005
 % Solids: 77.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1470			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	369.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	150000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	477.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	319.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	38.8	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

6480 U_{8A} 3/10/11

6480 U₇

6480 U₇

6480 U_J 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000266

EPA SAMPLE NO.

MR35J7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770005
 % Solids: 77.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.2	J	N	MS
7440-38-2	Arsenic	15.7		NE	MS
7440-39-3	Barium	18.7		N	MS
7440-41-7	Beryllium	0.22	J	E	MS
7440-43-9	Cadmium	0.58	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	1.8			MS
7440-48-4	Cobalt	1.0		*	MS
7440-50-8	Copper	104.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	1850		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	630.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.2	J		MS
7440-22-4	Silver	10.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.23	J		MS
7440-62-2	Vanadium	23.7			MS
7440-66-6	Zinc	265.		*E	MS
57-12-5	Cyanide				

1.30 μ
 J+ μ
 J+ μ
 0.650 J μ
 0.650 J μ
 J μ ~~KA~~ 2/18/11
 J+ μ
 J μ
 J μ
 3.20 μ
 J μ
 0.5 J μ
 J μ ~~KA~~ 2/18/11
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000267

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770006
 % Solids: 64.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2260			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	405.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	308000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	375.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	418.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	43.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

7750⁷7750⁷7750⁷7750⁷
2/18/10

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

..* 000268

EPA SAMPLE NO.

MH35J8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770006
 % Solids: 64.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	12.0		N	MS
7440-38-2	Arsenic	29.3		NE	MS
7440-39-3	Barium	68.3		N	MS
7440-41-7	Beryllium	0.16	J	E	MS
7440-43-9	Cadmium	35.4		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	2.2			MS
7440-48-4	Cobalt	0.41	J	*	MS
7440-50-8	Copper	286.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	5080		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	136.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.36	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.4	J		MS
7440-22-4	Silver	27.5		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.10	J		MS
7440-62-2	Vanadium	49.7			MS
7440-66-6	Zinc	11300		D*E	MS
57-12-5	Cyanide				

J+ⁿ
 J+ⁿ
 0.780 Jⁿ
 Jⁿ
 0.780ⁿ
 J+ⁿ
 Jⁿ
 0.780 Jⁿ
 3.90ⁿ
 Jⁿ
 J-ⁿ
 Jⁿ
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: COARSE

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000269

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770007
 % Solids: 88.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1130			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	57.7	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	8170			P
7439-92-1	Lead				
7439-95-4	Magnesium	45.9	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	714.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	22.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

56307^m56307^m

J+ Z

5630J^m
2/18/11Color Before: YELLOW Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000270

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35J9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770007
 % Solids: 88.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	13.5		N	MS
7440-38-2	Arsenic	34.9		NE	MS
7440-39-3	Barium	83.8		N	MS
7440-41-7	Beryllium	0.21	J	E	MS
7440-43-9	Cadmium	5.0		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	1.3			MS
7440-48-4	Cobalt	0.19	J	*	MS
7440-50-8	Copper	211.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	3880		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	423.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.19	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.7	J		MS
7440-22-4	Silver	34.6		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.61			MS
7440-62-2	Vanadium	7.8			MS
7440-66-6	Zinc	1400		D*E	MS
57-12-5	Cyanide				

J H
J+ H
J+ H
0.56 UJ H
J H

0.56 U H
J+ H
J H

0.56 UJ H
2.8 U H
J H

J H KA
J H 310/11
2/18/11

Color Before: YELLOW Clarity Before: _____ Texture: MEDIUMColor After: WHITE Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000271

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770008
 % Solids: 90.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1450			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	259.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	16900			P
7439-92-1	Lead				
7439-95-4	Magnesium	72.4	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1240			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	59.0	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

551 U H

551 U H

J+ H

551 U J H
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000272

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770008
 % Solids: 90.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	11.7		N	MS
7440-38-2	Arsenic	38.6		NE	MS
7440-39-3	Barium	97.2		N	MS
7440-41-7	Beryllium	0.32	J	E	MS
7440-43-9	Cadmium	7.6		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	0.97	J		MS
7440-48-4	Cobalt	0.23	J	*	MS
7440-50-8	Copper	471.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	4920		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	122.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.17	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.8	J		MS
7440-22-4	Silver	54.0		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.85			MS
7440-62-2	Vanadium	12.0			MS
7440-66-6	Zinc	2100		D*E	MS
57-12-5	Cyanide				

J #
 J+ #
 J+ #
 0.55 UJ #
 J #
 1.1 U #
 0.55 U #
 J+ #
 J #
 0.55 UJ #
 2.8 U #
 J #
 J #
 KJA
 3/10/11
 2/18/11

Color Before: YELLOW Clarity Before: _____ Texture: MEDIUM
 Color After: BROWN Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000273

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770009
 % Solids: 87.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2020			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	807.			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	21500			P
7439-92-1	Lead				
7439-95-4	Magnesium	950.			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1460			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	37.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J + M

569 UJ M
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000274

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770009
 % Solids: 87.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.26	J	N	MS
7440-38-2	Arsenic	90.2		NE	MS
7440-39-3	Barium	72.1		N	MS
7440-41-7	Beryllium	0.30	J	E	MS
7440-43-9	Cadmium	1.1		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	2.3			MS
7440-48-4	Cobalt	0.88		*	MS
7440-50-8	Copper	111.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	4510		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	843.		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.74		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.3	J		MS
7440-22-4	Silver	8.4		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	1.2		D	MS
7440-62-2	Vanadium	17.5			MS
7440-66-6	Zinc	319.		*E	MS
57-12-5	Cyanide				

1.10 J
 J+ M
 J+ M
 0.570 J M
 J M
 J KA
 J+ M
 J M
 J M
 J M
 2.80 J
 J M
 J KA
 J M
 2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUMColor After: GREEN Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

000275

EPA SAMPLE NO.

MH35K2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770010
 % Solids: 90.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11200			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1360			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	36000			P
7439-92-1	Lead				
7439-95-4	Magnesium	11100			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	872.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	105.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ M
552 UJ M
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000276

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770010
 % Solids: 90.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.25	J	N	MS
7440-38-2	Arsenic	96.8		NE	MS
7440-39-3	Barium	34.9		N	MS
7440-41-7	Beryllium	0.20	J	E	MS
7440-43-9	Cadmium	0.55		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	11.9			MS
7440-48-4	Cobalt	5.5		*	MS
7440-50-8	Copper	47.1		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	1030		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1620		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	5.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.60	J		MS
7440-22-4	Silver	5.7		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.36	J	D	MS
7440-62-2	Vanadium	62.1			MS
7440-66-6	Zinc	187.		*E	MS
57-12-5	Cyanide				

1.10 ^u
 J+ ^u
 J+ ^u
 0.550J ^u
 0.550J ^u
 J ^u KA 2/18/11
 J+ ^u
 J ^u
 J ^u
 2.80 ^u
 J ^u
 J - ^u
 J ^u KA 2/18/11
 J ^u
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: WHITE Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000277

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K3

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
Matrix: Soil Lab Sample ID: 1030770011
% Solids: 93.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	665.			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	34.8	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	22200			P
7439-92-1	Lead				
7439-95-4	Magnesium	38.2	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1200			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	53.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

535 U⁷
535 U⁷
J + 7⁷
535 U⁷
2/18/11

Color Before: YELLOW Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000278

EPA SAMPLE NO.

MH35K3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770011
 % Solids: 93.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	12.2		N	MS
7440-38-2	Arsenic	55.2		NE	MS
7440-39-3	Barium	81.3		N	MS
7440-41-7	Beryllium	0.11	J	E	MS
7440-43-9	Cadmium	40.0		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	0.86	J		MS
7440-48-4	Cobalt	0.35	J	*	MS
7440-50-8	Copper	4600		D*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	15500		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	177.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.27	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	3.4			MS
7440-22-4	Silver	113.		DN	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.73			MS
7440-62-2	Vanadium	7.1			MS
7440-66-6	Zinc	10400		D*E	MS
57-12-5	Cyanide				

J N
 J+ N
 J+ N
 0.54 UJ M
 J N
 1.1 U M
 0.54 U M
 J+ M
 J N
 0.54 UJ M
 J K_A 2/10/11
 J M K_A 3/10/11
 J N
 2/18/11

Color Before: GREEN Clarity Before: _____ Texture: MEDIUM
 Color After: GRAY Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000279

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770012
 % Solids: 92.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13000			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2030			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	25200			P
7439-92-1	Lead				
7439-95-4	Magnesium	12700			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	671.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	64.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J + M
541 UJ M
2/18/11

Color Before: YELLOW Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000280

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770012
 % Solids: 92.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.54	J	N	MS
7440-38-2	Arsenic	32.8		NE	MS
7440-39-3	Barium	46.1		N	MS
7440-41-7	Beryllium	0.35	J	E	MS
7440-43-9	Cadmium	0.70		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	10.0			MS
7440-48-4	Cobalt	4.6		*	MS
7440-50-8	Copper	33.1		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	2260		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	3280		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	5.3		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.83	J		MS
7440-22-4	Silver	4.6		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.38	J		MS
7440-62-2	Vanadium	60.8			MS
7440-66-6	Zinc	210.		*E	MS
57-12-5	Cyanide				

1.1 U #
 J+ #
 J+ #
 0.54 UJ #
 J #
 J # KA 3/10/11
 J+ #
 J #
 J #
 J #
 2.7 U #
 J #
 J- # KA 3/10/11
 J #
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000281

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770013
 % Solids: 90.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	906.			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	48.6	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	7700			P
7439-92-1	Lead				
7439-95-4	Magnesium	118.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	961.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	53.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

554 U K

554 U K

J+ K

554 U J^{Final}
2/18/11

Color Before: GRAY Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000282

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K5

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770013
 % Solids: 90.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.99	J	N	MS
7440-38-2	Arsenic	13.6		NE	MS
7440-39-3	Barium	37.1		N	MS
7440-41-7	Beryllium	0.13	J	E	MS
7440-43-9	Cadmium	0.53		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	0.46	J		MS
7440-48-4	Cobalt	0.12	J	*	MS
7440-50-8	Copper	63.1		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	1050		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	135.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	0.14	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.90	J		MS
7440-22-4	Silver	6.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.43	J		MS
7440-62-2	Vanadium	4.9			MS
7440-66-6	Zinc	140.		*E	MS
57-12-5	Cyanide				

1.1 U ^M
 J+ ^M
 J+ ^M
 0.55 U J ^M
 0.55 U J ^M
 1.1 U ^M
 0.55 U ^M
 J+ ^M
 J ^M
 0.55 U J ^M
 2.8 U ^M
 J ^M
 J - ^M KA
 J ^M 3holl
 J ^M
 2/18/11

Color Before: GREEN Clarity Before: _____ Texture: MEDIUM
 Color After: GREEN Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000283

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K6

Lab Name: ALS Laboratory Group Contract: EPW09036

Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7

Matrix: Soil Lab Sample ID: 1030770014

% Solids: 91.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3270			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	246.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	46300		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	1920			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	769.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	70.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

5470TH

J+TH

5470JTH
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000284

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770014
 % Solids: 91.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	3.6		N	MS
7440-38-2	Arsenic	37.7		NE	MS
7440-39-3	Barium	68.4		N	MS
7440-41-7	Beryllium	0.19	J	E	MS
7440-43-9	Cadmium	9.0		E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	2.7			MS
7440-48-4	Cobalt	1.5		*	MS
7440-50-8	Copper	285.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	3170		D*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	433.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.4		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.3	J		MS
7440-22-4	Silver	22.9		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.37	J		MS
7440-62-2	Vanadium	15.4			MS
7440-66-6	Zinc	2580		D*E	MS
57-12-5	Cyanide				

J M
 J+ N
 J+ N
 0.56 UJ N
 J N
 J HA
 J+ N (3/10/11)
 J N
 J N
 2.7 U N
 J KA (3/10/11)
 J- N
 J KA (3/10/11)
 J N
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: BROWN Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000285

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770015
 % Solids: 83.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19500			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1540			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	55900		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	9940			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1090			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	59.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ 2
597 UJth
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000287

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K8

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770016
 % Solids: 75.3 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13600			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1310			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	37200			P
7439-92-1	Lead				
7439-95-4	Magnesium	7200			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	645.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	22.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

664 U⁷664 UJ⁷

2/10/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000289

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K9

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
Matrix: Soil Lab Sample ID: 1030770017
% Solids: 14.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6720			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2040	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	141000			P
7439-92-1	Lead				
7439-95-4	Magnesium	2120	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1130	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	139.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

3380 U^M
3380 U^M
3380 U^M
3380 UJ^M
2/18/10

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

* 000290

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35K9

Lab Name: ALS Laboratory Group Contract: EPW09036

Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7

Matrix: Soil Lab Sample ID: 1030770017

% Solids: 14.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	5.2	J	N	MS
7440-38-2	Arsenic	42.6		NE	MS
7440-39-3	Barium	119.		N	MS
7440-41-7	Beryllium	0.84	J	E	MS
7440-43-9	Cadmium	1.7	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	19.7			MS
7440-48-4	Cobalt	4.8		*	MS
7440-50-8	Copper	303.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	668.		*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1180			MS
7439-97-6	Mercury				
7440-02-0	Nickel	5.9		E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	2.0	J		MS
7440-22-4	Silver	27.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.31	J		MS
7440-62-2	Vanadium	20.8			MS
7440-66-6	Zinc	350.		*E	MS
57-12-5	Cyanide				

6.8 U #
J+ #
J+ #
3.4 UJ #
3.4 UJ #
J # KA
J+ # 3/10/11
J #
J #
17 U #
J #
J- #
J # KA
J # 3/10/11
J #
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: FINE

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000291

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
MH35L0

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
Matrix: Soil Lab Sample ID: 1030770018
% Solids: 69.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3020			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	223.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	5150			P
7439-92-1	Lead				
7439-95-4	Magnesium	1090			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	307.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	23.0	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

718 Uth
718 Uth
718 Uth
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000293

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35L1

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
Matrix: Soil Lab Sample ID: 1030770019
% Solids: 58.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11500			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1280			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	27100			P
7439-92-1	Lead				
7439-95-4	Magnesium	5670			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1210			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	44.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ m
88 855 UJ
7/18/10

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

.. 000295

EPA SAMPLE NO.

MH35L2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770020
 % Solids: 83.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15700			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1990			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	71200		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	11500			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	642.			P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	16.7	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+
600 UJ^M
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000297

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH35L3

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
Matrix: Soil Lab Sample ID: 1030770021
% Solids: 16.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	986.			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	279.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	273000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	486.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	773.	J		P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	48.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

2980 UTH
2980 UTH
2980 UTH
2980 U^J
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000298

EPA SAMPLE NO.

MH35L3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH35H7
 Matrix: Soil Lab Sample ID: 1030770021
 % Solids: 16.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	23.3		N	MS
7440-38-2	Arsenic	969.		NE	MS
7440-39-3	Barium	37.1		N	MS
7440-41-7	Beryllium	0.11	J	E	MS
7440-43-9	Cadmium	2.8	J	E	MS
7440-70-2	Calcium				
7440-47-3	Chromium	11.3			MS
7440-48-4	Cobalt	1.4	J	*	MS
7440-50-8	Copper	235.		*NE	MS
7439-89-6	Iron				
7439-92-1	Lead	1100		*	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	304.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.6	J	E	MS
7440-09-7	Potassium				
7782-49-2	Selenium	4.2	J		MS
7440-22-4	Silver	13.2		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.19	J		MS
7440-62-2	Vanadium	57.1			MS
7440-66-6	Zinc	524.		*E	MS
57-12-5	Cyanide				

J #
 J+ #
 J+ #
 3.0 UJ #
 3.0 UJ #
 3.0 U #
 J+ #
 J #
 3.0 UJ #
 15 U #
 J #
 J- #
 J #
 KA
 3/10/11
 2/18/11

Color Before: RED Clarity Before: _____ Texture: MEDIUM
 Color After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case/TDD No.	Site Name	Operable Unit	
40755 / 1008-16	Upper Animás Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	MH36L0	

Review Assigned Date: December 15, 2010

Data Validator: Fred Luck

Review Completion Date: February 18, 2011

Report Reviewer: Lesley Boyd

Sample ID	Matrix	Analysis
MH36L0	Sediment	CLP -Metals
MH36L1		
MH36L2		
MH36L3		
MH36L4		
MH36L5	Mine Sediment	
MH36L6	Sediment	
MH36L7		
MH36L8		
MH36L9		

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
- () Data are UNACCEPTABLE according to EPA Functional Guidelines.
- (X) Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X

CLP Project Officer Attention Required? Yes _____ No X If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT

REVIEW NARRATIVE SUMMARY

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review," January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, Case No. 40755, SDG No. MH36L0, consisted of ten sediment / mine sediment samples for metals by ICP-AES and ICP-MS (ISM01.2). The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
MH36L0, MH36L1, MH36L2, MH36L3, MH36L4, MH36L5, MH36L7, MH36L8, MH36L9	Antimony	U	Blank Contamination	3
MH36L9	Barium			
MH36L0, MH36L2, MH36L4, MH36L5, MH36L6, MH36L7, MH36L8, MH36L9	Beryllium			
MH36L0, MH36L5, MH36L8, MH36L9	Cadmium			
MH36L2, MH36L4, MH36L5, MH36L9	Calcium			
MH36L5, MH36L9	Chromium			
MH36L5, MH36L9	Cobalt			
MH36L5	Nickel			
MH36L0, MH36L1, MH36L2, MH36L3, MH36L4, MH36L5, MH36L6, MH36L7, MH36L8, MH36L9	Selenium			
MH36L5, MH36L9	Silver			
MH36L1, MH36L3	Beryllium			
All Samples	Potassium			
MH36L0, MH36L1, MH36L2, MH36L3, MH36L4, MH36L6, MH36L7, MH36L8	Silver			
All Samples	Sodium			
	Thallium			

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
All Samples	Selenium, Thallium	J- /UJ	MS 30 - 74%R, Post Digestion Spike %R < 75%	7
	Antimony, Silver	J/UJ	MS <30%R, Post Digestion Spike %R ≥ 75%	
	Arsenic, Lead, Potassium, Sodium, Zinc	J	Serial Dilution %D > 10%	8

1. PRESERVATION AND HOLDING TIMES

All technical holding times and preservation criteria were met.

Yes No

Comments: The samples were analyzed within 180 days for the ICP metals. According to the Sample Log-In Sheet and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. The Sample Log-In Sheet further indicates that neither cooler contained a Cooler Temperature Indicator Bottle, as indicated on the form to be required. There is also no indication that SMO was contacted regarding this issue, neither is any documentation of the resolution or indication of how the cooler temperature was derived provided. The TR/COC also did not designate a sample for laboratory QC, but the documentation of the resolution of this issue is provided in the SDG.

When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

The field sampler had used CLP IDs in the incorrect format using the letter 'I' in accordance with the reported previous directions from Region 8, the SMO coordinator assigned new sample IDs to the affected samples and the laboratory was to note this issue in the SDG narrative, which is did. There is no apparent indication that the laboratory had any error involving sample confusion.

No other shipping or receiving problems were noted. Chain-of-custody, summary forms, and raw data were evaluated.

2. INSTRUMENT CALIBRATIONS: INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICV AND CCV)

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes No

Comments: None.

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes No

Comments: None.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes X No

Comments: None.

3. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes X No

Comments: For the ICP-AES analyses, the ICB was rerun.

The continuing calibration blanks were run at 10% frequency.

Yes X No

Comments: Continuing calibration blanks were run every 10 samples.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No

Comments: None.

All analyzed blanks were free of contamination.

Yes No X

Comments: The following table lists the blanks with contamination that resulted in sample qualification, elements present, affected samples, and data qualifiers:

Blank Contaminants

Blank ID	Contaminant	CRQL	MDL (mg/Kg)	Concentration Found in Blank (mg/Kg)	Associated Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
PB	Antimony	1	0.0097	0.030	MH36L0	0.53	1.3 U
					MH36L1	0.45	1.3 U
					MH36L2	0.86	1.6 U
					MH36L3	0.45	1.4 U
					MH36L4	1.7	2.0 U
					MH36L5	0.31	3.2 U
					MH36L7	0.45	1.3 U
					MH36L8	0.19	1.3 U
					MH36L9	0.44	5.0 U
PB	Barium	5	0.044	5.0	MH36L9	21.4	24.9 U
PB	Beryllium	0.5	0.0032	0.011	MH36L0	0.38	0.63 U
					MH36L2	0.30	0.80 U
					MH36L4	0.34	1.0 U
					MH36L5	0.79	1.6 U
					MH36L6	0.46	0.95 U
					MH36L7	0.45	0.65 U
					MH36L8	0.53	0.63 U
					MH36L9	1.4	2.5 U
PB	Cadmium	0.5	0.0027	0.50	MH36L0	0.73	0.63 U
					MH36L5	0.11	1.6 U
					MH36L8	0.42	0.63 U
					MH36L9	1.2	2.5 U
PB	Calcium	500	1.7	2.587	MH36L2	592	804 U
					MH36L4	851	1030 U
					MH36L5	1540	1580 U
					MH36L9	2310	2490 U
PB	Chromium	1	0.026	1.00	MH36L5	2.6	3.2 U
					MH36L9	2.8	5.0 U
PB	Cobalt	1	0.0053	0.024	MH36L5	1.5	1.6 U
					MH36L9	1.5	2.5 U
PB	Nickel	0.5	0.013	0.500	MH36L5	1.2	1.6 U
PB	Selenium	2.5	0.036	2.500	MH36L0	0.55	3.1 U
					MH36L1	0.32	3.3 U
					MH36L2	0.86	4.0 U
					MH36L3	0.70	3.5 U
					MH36L4	1.2	5.1 U
					MH36L5	0.16	7.9 U
					MH36L6	1.4	4.8 U
					MH36L7	1.2	3.3 U
					MH36L8	0.61	3.1 U
MH36L9	12.4	12.4 U					
PB	Silver	0.5	0.0023	0.006	MH36L5	0.31	1.6 U
					MH36L9	0.71	2.5 U

UOS

URS Operating Services, Inc.

Data Validation Report

4. INDUCTIVELY COUPLED PLASMA - INTERFERENCE CHECK SAMPLE (ICP-ICS)

The ICP interference check sample (ICS) was run at the beginning and end of each sample analysis run and every 20 analytical samples, but not prior to the ICV.

Yes X No

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within ± the CRQL.

Yes No X

Comments: For Potassium and Sodium, the ICP-AES Interference Check Sample Results exceeded the True Values by approximately 1.8 to 2.0 times the CRQL, this analysis was repeated with similar results. Results for these analytes that are \geq MDL have been qualified as estimated high (J+).

Sample results for aluminum, calcium, iron, and magnesium were less than the ICSA values or no interference was noted.

Yes X No NA

Comments: None.

Sample results contain potential false positives and false negatives.

Yes X No

Comments: The following table lists the elements with potential false positives or false negatives that resulted in sample qualification, affected samples, and data qualifiers:

ICP Interferences

Element	Concentration Found in ICSA Sample (ug/L)	Affected Samples	Concentration Found in Sample (mg/Kg)	Qualifier/Adjustment
Beryllium	0.39	MH36L1 MH36L3	>MDL	J+
Potassium	1020	All samples		
Silver	0.027	MH36L0 MH36L1 MH36L2 MH36L3 MH36L4 MH36L6 MH36L7 MH36L8		
Sodium	975	All samples		
Thallium	0.049	All samples		

5. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No

Comments: None.

All results were within control limits OF 70-130%.

Yes X No

Comments: None.

6. FORM 6 & 12 - DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No NA

Comments: None.

The RPDs were calculated correctly.

Yes No NA

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were within 20% (limits of 35% apply for soil/sediments/tailings samples).

Yes No NA

Comments: None.

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of CRQL (absolute difference < CRQL for soils).

Yes No NA

Comments: None.

7. SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No NA

Comments: None.

The percent recoveries (%Rs) were calculated correctly.

Yes No NA

Comments: None

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes No

Comments: The following table lists the spike recoveries outside control limits, post digestion spike recoveries, samples affected, and data qualifiers:

Element	Matrix Spike %R	Post-Digestion %R	Samples Affected	Qualifiers
Antimony	20%	85%	All samples	J/UJ
Selenium	55%	67%		J-/UJ
Silver	-11%	86%		J/UJ
Thallium	74%	69%		J-/UJ

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Ag, Hg).

Yes No NA

Comments: None.

8. ICP SERIAL DILUTION

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes No

Comments: None.

The serial dilution was without interference problems as defined by the SOW.

Yes No

Comments: The following serial dilution %Ds were greater than 10% and the original sample result was at least 50* the MDL:

Element	% Difference	Samples Affected	Qualifiers
Arsenic	18%	All samples	J
Lead	34%		
Potassium	19%		
Sodium	27%		
Zinc	24%		

9. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

Yes___ No___ NA X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

10. FORM 10 - INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes X No___

Comments: None.

11. FORM 12 - PREPARATION LOG

Information on the preparation of samples for analysis was reported on Form 12:

Yes X No___

Comments: None.

12. FORM 13 - ANALYSIS RUN LOG

A Form 13 with the required information was filled out for each analysis run in the data package.

Yes X No___

Comments: None.

13. Additional Comments or Problems/Resolutions Not Addressed Above

Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

INORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality. Use of additional qualifiers should be carefully considered. Definitions for all qualifiers used should be provided with each report.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." The data are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample.
- J+ - The associated numerical value is an estimated quantity but the result may be biased high.
- J- - The associated numerical value is an estimated quantity but the result may be biased low.
- U J - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample.
- N J - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

ACRONYMS

AA	Atomic Absorption
Ag	Silver
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRA	CRQL standard required for AA
CRQL	Contract Required Quantitation Limit
CRI	CRQL standard required for ICP
CV	Cold Vapor
EPA	U.S. Environmental Protection Agency
GFAA	Graphite Furnace Atomic Absorption
Hg	Mercury
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
ICSA	Interference Check Sample (Solution A)
ICSAB	Interference Check Sample (Solution AB)
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LRA	Linear Range Verification Analysis
MDL	Method Detection Limit
PDS	Post Digestion Spike
QC	Quality Control
RPD	Relative Percent Difference
RPM	Regional Project Manager
RSD	Percent Relative Standard Deviation
SA	Spike Added
SAS	Special Analytical Services
SDG	Sample Delivery Group
SOW	Statement of Work
SR	Sample Result
SSR	Spiked Sample Result

000313

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L0

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771001
 % Solids: 79.4 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8100			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1740			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	38100			P
7439-92-1	Lead				
7439-95-4	Magnesium	5830			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	440.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	30.8	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ ~~7~~
 J+ ~~7~~
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: COARSEColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000315

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L1

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771002
 % Solids: 74.7 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13100			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2020			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	35000			P
7439-92-1	Lead				
7439-95-4	Magnesium	8970			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	501.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	21.9	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ π
J+ π
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: COARSE
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000317

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771003
 % Solids: 62.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5960			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	592.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	116000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	3260			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	842.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	65.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

804 U H

J+ H

J+ H

2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000318

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L2

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771003
 % Solids: 62.2 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.86	J	N	MS
7440-38-2	Arsenic	62.5		E	MS
7440-39-3	Barium	121.		*	MS
7440-41-7	Beryllium	0.30	J	E	MS
7440-43-9	Cadmium	1.4			MS
7440-70-2	Calcium				
7440-47-3	Chromium	8.5			MS
7440-48-4	Cobalt	5.4		*	MS
7440-50-8	Copper	177.			MS
7439-89-6	Iron				
7439-92-1	Lead	546.		E	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1130		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	4.5			MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.86	J	N	MS
7440-22-4	Silver	5.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.30	J	N	MS
7440-62-2	Vanadium	42.6			MS
7440-66-6	Zinc	444.		E	MS
57-12-5	Cyanide				

1.6 UJ π
 J π
 J ~~KA~~ 3/10/11
 0.8 U π

J ~~KA~~ 3/10/11

J π

4.0 UJ π
 J+ π
 J+ π
 J π
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000319

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771004
 % Solids: 70.9 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12200			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1110			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	31900			P
7439-92-1	Lead				
7439-95-4	Magnesium	5340			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	648.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	29.5	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ M

J+ M
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000320

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L3

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771004
 % Solids: 70.9 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.45	J	N	MS
7440-38-2	Arsenic	36.8		E	MS
7440-39-3	Barium	147.		*	MS
7440-41-7	Beryllium	1.4		E	MS
7440-43-9	Cadmium	7.4			MS
7440-70-2	Calcium				
7440-47-3	Chromium	9.6			MS
7440-48-4	Cobalt	12.9		*	MS
7440-50-8	Copper	546.			MS
7439-89-6	Iron				
7439-92-1	Lead	779.		DE	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	5130		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	6.9			MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.70	J	N	MS
7440-22-4	Silver	2.8		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.40	J	N	MS
7440-62-2	Vanadium	33.2			MS
7440-66-6	Zinc	1990		DE	MS
57-12-5	Cyanide				

1.4 UJ ~~MS~~
 J ~~MS~~
 J+ ~~MS~~ KA 3/10/11
 J ~~MS~~ KA 3/10/11
 J ~~MS~~
 J+ ~~MS~~
 J+ ~~MS~~
 J ~~MS~~
 3.5 UJ ~~MS~~
 J+ ~~MS~~
 J+ ~~MS~~
 J ~~MS~~
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000321

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771005
 % Solids: 48.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8140			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	851.	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	154000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	4670			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1120		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	98.1	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

10350 π J+ π J+ π
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM
 Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000322

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L4

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771005
 % Solids: 48.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	1.7	J	N	MS
7440-38-2	Arsenic	86.3		E	MS
7440-39-3	Barium	168.		*	MS
7440-41-7	Beryllium	0.34	J	E	MS
7440-43-9	Cadmium	1.2			MS
7440-70-2	Calcium				
7440-47-3	Chromium	9.8			MS
7440-48-4	Cobalt	6.1		*	MS
7440-50-8	Copper	251.			MS
7439-89-6	Iron				
7439-92-1	Lead	656.		E	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1400		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	4.8			MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.2	J	N	MS
7440-22-4	Silver	7.5		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.31	J	N	MS
7440-62-2	Vanadium	44.3			MS
7440-66-6	Zinc	464.		E	MS
57-12-5	Cyanide				

2.0 UJ π
~~J π~~
~~J π KA~~ 3/10/11
 1.0 U π
~~J π KA~~ 3/10/11
 J π
 J π
 5.1 UJ π
 J+ π
 J+ π
 J π
 2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUMColor After: BROWN Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

..* 000323

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L5

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
Matrix: Soil Lab Sample ID: 1030771008
% Solids: 31.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5480			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1540			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	359000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	644.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	146.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	31.2	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

1580 U *M*

J+ *M*

J+ *M*
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUM

Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000324

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L5

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
Matrix: Soil Lab Sample ID: 1030771008
% Solids: 31.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.31	J	N	MS
7440-38-2	Arsenic	19.1		E	MS
7440-39-3	Barium	17.4		*	MS
7440-41-7	Beryllium	0.79	J	E	MS
7440-43-9	Cadmium	0.23	J		MS
7440-70-2	Calcium				
7440-47-3	Chromium	2.6	J		MS
7440-48-4	Cobalt	1.5	J	*	MS
7440-50-8	Copper	20.2			MS
7439-89-6	Iron				
7439-92-1	Lead	115.		E	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	280.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.2	J		MS
7440-09-7	Potassium				
7782-49-2	Selenium	0.16	J	N	MS
7440-22-4	Silver	0.31	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	1.6	U	N	MS
7440-62-2	Vanadium	45.9			MS
7440-66-6	Zinc	282.		E	MS
57-12-5	Cyanide				

3.20 J #
J #
J # BA 3 hold
1.60 #
1.60 #
3.20 #
1.60 J #
J #
1.60 #
7.90 J #
1.60 J #
J + #
J #
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: FINE

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000325

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771009
 % Solids: 52.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7030			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1420			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	114000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	3810			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1560		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	118.	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ π J+ π

2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: MEDIUMColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000326

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L6

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771009
 % Solids: 52.6 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	2.8		N	MS
7440-38-2	Arsenic	50.2		E	MS
7440-39-3	Barium	146.		*	MS
7440-41-7	Beryllium	0.46	J	E	MS
7440-43-9	Cadmium	2.9			MS
7440-70-2	Calcium				
7440-47-3	Chromium	8.4			MS
7440-48-4	Cobalt	3.9		*	MS
7440-50-8	Copper	279.			MS
7439-89-6	Iron				
7439-92-1	Lead	5720		DE	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1340		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	3.8			MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.4	J	N	MS
7440-22-4	Silver	12.1		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.60	J	N	MS
7440-62-2	Vanadium	47.7			MS
7440-66-6	Zinc	815.		E	MS
57-12-5	Cyanide				

J H
J H
J H
0.95 U H
KSA
3/10/11

J H KSA
3/10/11

J H

4.80 U H
J+ H

J+ H

J H
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: FINEColor After: WHITE Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000327

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
MH36L7

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
Matrix: Soil Lab Sample ID: 1030771010
% Solids: 76.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9570			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1530			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	57600			P
7439-92-1	Lead				
7439-95-4	Magnesium	6070			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	751.		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	62.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ M
J+ K
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: COARSE
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

000328

EPA SAMPLE NO.

MH36L7

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771010
 % Solids: 76.8 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.45	J	N	MS
7440-38-2	Arsenic	20.3		E	MS
7440-39-3	Barium	97.3		*	MS
7440-41-7	Beryllium	0.45	J	E	MS
7440-43-9	Cadmium	0.90			MS
7440-70-2	Calcium				
7440-47-3	Chromium	7.0			MS
7440-48-4	Cobalt	11.8		*	MS
7440-50-8	Copper	86.5			MS
7439-89-6	Iron				
7439-92-1	Lead	726.		DE	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	1530		D	MS
7439-97-6	Mercury				
7440-02-0	Nickel	4.4			MS
7440-09-7	Potassium				
7782-49-2	Selenium	1.2	J	N	MS
7440-22-4	Silver	1.7		N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	0.39	J	N	MS
7440-62-2	Vanadium	47.3			MS
7440-66-6	Zinc	261.		E	MS
57-12-5	Cyanide				

1.30 J #
J # KA 3/10/11
0.650 #

J # KA 3/10/11

J #

3.30 J #
J+ #

J+ KA 3/10/11

J #
2/18/11

Color Before: BROWN Clarity Before: _____ Texture: MEDIUM

Color After: BROWN Clarity After: CLOUDY Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000329

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
MH36L8

Lab Name: ALS Laboratory Group Contract: EPW09036
Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
Matrix: Soil Lab Sample ID: 1030771011
% Solids: 79.5 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10900			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	1890			P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	37100			P
7439-92-1	Lead				
7439-95-4	Magnesium	5380			P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	1000		E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	99.3	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

J+ *TK*
J+ *TK*
2/18/11

Color Before: ORANGE Clarity Before: _____ Texture: COARSE
Color After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:
E: The reported value is estimated due to the presence of interference.

000331

USEPA - CLP
1A-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771012
 % Solids: 20.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13400			P
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium	2310	J		P
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron	238000		D	P
7439-92-1	Lead				
7439-95-4	Magnesium	913.	J		P
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium	231.	J	E	P
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium	44.5	J	E	P
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

24900 π J+ π J+ π KBA
3/10/14Color Before: ORANGE Clarity Before: _____ Texture: FINEColor After: YELLOW Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

000332

USEPA - CLP
1B-IN
INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MH36L9

Lab Name: ALS Laboratory Group Contract: EPW09036
 Lab Code: DATA C Case No.: 40755 Mod. Ref. No.: _____ SDG No.: MH36L0
 Matrix: Soil Lab Sample ID: 1030771012
 % Solids: 20.1 Date Received: 11/03/2010

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony	0.44	J	N	MS
7440-38-2	Arsenic	17.7		E	MS
7440-39-3	Barium	21.4	J	*	MS
7440-41-7	Beryllium	1.4	J	E	MS
7440-43-9	Cadmium	0.35	J		MS
7440-70-2	Calcium				
7440-47-3	Chromium	2.8	J		MS
7440-48-4	Cobalt	1.5	J	*	MS
7440-50-8	Copper	28.1			MS
7439-89-6	Iron				
7439-92-1	Lead	217.		E	MS
7439-95-4	Magnesium				
7439-96-5	Manganese	336.			MS
7439-97-6	Mercury				
7440-02-0	Nickel	1.3	J		MS
7440-09-7	Potassium				
7782-49-2	Selenium	12.4	U	N	MS
7440-22-4	Silver	0.71	J	N	MS
7440-23-5	Sodium				
7440-28-0	Thallium	2.5	U	N	MS
7440-62-2	Vanadium	41.8			MS
7440-66-6	Zinc	269.		E	MS
57-12-5	Cyanide				

5.0 UJ ⁷
 J ⁷
~~25.0 UJ~~ 24.9 UJ ⁷
 2.5 U ⁷
 2.5 U ⁷
 5.0 U ⁷
 2.5 U J ⁷
 J ⁷
 12.4 UJ ⁷
 2.5 UJ ⁷
 UJ KA 3/10/14
 J ³
 KA
 3/10/14

Color Before: ORANGE Clarity Before: _____ Texture: FINEColor After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

E: The reported value is estimated due to the presence of interference.

UOS

URS Operating Services, Inc.

Data Validation Report

**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case No. / TDD No.	Site Name	Operable Unit	
C101001 / 1008-13	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	TDF No.	Laboratory DPO/Region
ESAT – TechLaw, Inc.		DG-216 surface water and mine discharge	

Review Assigned Date March 28, 2011
Review Completion Date March 31, 2011

Data Validator Diane Short & Assoc. Review
Report Reviewer Kent Alexander

Station	Client ID	Lab ID	Sample Type
Method 200.7 ICP, 200.8 ICPMS Total and Dissolved (D)			
A68	UASW003	C101101-01	Surface Water
A72	UASW029	C101101-02	Surface Water
CC01F	UASW030	C101101-03	Surface Water
CC01S	UASW024	C101101-04	Surface Water
CC01T	UASW023	C101101-05	Surface Water
CC02A	UASW022	C101101-06	Surface Water
CC02D	UAAD004	C101101-07	Mine Discharge (D)
CC02D	UAAD004	C101101-08	Mine Discharge
CC03C	UAAD003	C101101-09	Mine Discharge (D)
CC03C	UAAD003	C101101-10	Mine Discharge
CC03D	UASW015	C101101-11	Surface Water
CC06	UAAD002	C101101-12	Mine Discharge (D)
CC06	UAAD002	C101101-13	Mine Discharge
CC17	UASW005	C101101-14	Surface Water
CC17 DUP	UASW098	C101101-15	Surface Water
CC18	UASW007	C101101-16	Surface Water
CC19	UAAD001	C101101-17	Mine Discharge (D)
CC19	UAAD001	C101101-18	Mine Discharge

UOS

URS Operating Services, Inc.

Data Validation Report

Station	Client ID	Lab ID	Sample Type
CC48	UASW035	C101101-19	Surface Water
CC48 DUP	UASW097	C101101-20	Surface Water
CCOPP-12	UASW016	C101101-21	Surface Water
M34	UASW033	C101101-22	Surface Water
UASW001	UASW001	C101101-23	Surface Water
UASW002	UASW002	C101101-24	Surface Water
UASW004	UASW004	C101101-25	Surface Water
UASW006	UASW006	C101101-26	Surface Water
UASW008	UASW008	C101101-27	Surface Water
UASW009	UASW009	C101101-28	Surface Water
UASW010	UASW010	C101101-29	Surface Water
UASW011	UASW011	C101101-30	Surface Water
UASW012	UASW012	C101101-31	Surface Water
UASW013	UASW013	C101101-32	Surface Water
UASW014	UASW014	C101101-33	Surface Water
UASW017	UASW017	C101101-34	Surface Water
UASW018	UASW018	C101101-35	Surface Water
UASW019	UASW019	C101101-36	Surface Water
UASW019 DUP	UASW099	C101101-37	Surface Water
UASW020	UASW020	C101101-38	Surface Water
UASW021	UASW021	C101101-39	Surface Water
UASW032	UASW032	C101101-40	Surface Water
UASW034	UASW034	C101101-41	Surface Water
UASW036	UASW036	C101101-42	Surface Water
UASW037	UASW037	C101101-43	Surface Water
UASW039	UASW039	C101101-44	Surface Water
UASW040	UASW040	C101101-45	Surface Water
UASW041	UASW041	C101101-46	Surface Water
UASW042	UASW042	C101101-47	Surface Water
UASW043	UASW043	C101101-48	Surface Water
UASW044	UASW044	C101101-49	Surface Water
UASW045	UASW045	C101101-50	Surface Water
UASW046	UASW046	C101101-51	Surface Water
UASW047	UASW047	C101101-52	Surface Water
UASW049	UASW049	C101101-53	Surface Water
UASW050	UASW050	C101101-54	Surface Water
UASW054	UASW054	C101101-55	Surface Water
UASW056	UASW056	C101101-56	Surface Water
UASW058	UASW058	C101101-57	Surface Water
UASW059	UASW059	C101101-58	Surface Water

UOS

URS Operating Services, Inc.

Data Validation Report

Station	Client ID	Lab ID	Sample Type
Analysis for Hardness SM 2340B			
CC02D	UAAD004	C101101-07	Mine Discharge
CC03C	UAAD003	C101101-09	Mine Discharge
CC06	UAAD002	C101101-12	Mine Discharge
CC19	UAAD001	C101101-17	Mine Discharge

UOS

URS Operating Services, Inc.

Data Validation Report

DATA QUALITY STATEMENT

- Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
- Data are UNACCEPTABLE according to EPA Functional Guidelines.
- Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X

CLP Project Officer Attention Required? Yes _____ No X If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT

REVIEW NARRATIVE SUMMARY

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-20% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified representing all data packages received for this review. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, TDF No. DG-216, consisted of 54 total surface water and mine discharge and 4 dissolved mine discharge samples for Total Recoverable Metals and Dissolved Metals by Methods 200.7 ICP and 200.8 by ICPMS. The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Station ID	Client ID	Lab ID	Analyte	Result ug/L	EPA Qualifier	DSA Qualifier
A68	UASW003	C101101-01	Silver	0.843	U	UCB.6
A68	UASW003	C101101-01	Molybdenum	3.63	U	UCB1.35
CC01S	UASW024	C101101-04	Beryllium	0.968	J+	JC110.3
CC02D	UAAD004	C101101-07	Molybdenum	1.99	U	UCB1.25
CC02D	UAAD004	C101101-08	Beryllium	4.82	J+	JC110.3
CC03C	UAAD003	C101101-09	Molybdenum	1.54	U	UCB2.5
CC03C	UAAD003	C101101-10	Beryllium	8.40	J+	JC110.3
CC03D	UASW015	C101101-11	Beryllium	6.95	J+	JC110.3
CC06	UAAD002	C101101-13	Beryllium	7.03	J+	JC110.3
CC17	UASW005	C101101-14	Molybdenum	0.535	U	UCB1.35
CC18	UASW007	C101101-16	Beryllium	3.54	J+	JC110.3
CC19	UAAD001	C101101-18	Beryllium	4.18	J+	JC110.3
CC48 DUP	UASW097	C101101-20	Beryllium	1.30	J+	JC110.3
UASW001	UASW001	C101101-23	Beryllium	1.17	J+	JC110.3
UASW002	UASW002	C101101-24	Silver	0.953	U	UCB.6
UASW002	UASW002	C101101-24	Molybdenum	1.04	U	UCB1.35
UASW034	UASW034	C101101-41	Molybdenum	0.670	U	UCB1.35
UASW036	UASW036	C101101-42	Molybdenum	0.900	U	UCB1.35
UASW036	UASW036	C101101-42	Silver	0.891	U	UCB.6
UASW037	UASW037	C101101-43	Molybdenum	0.557	U	UCB1.35

Sample Tracking:

There are Deliverable Submission Forms, but no actual laboratory log-in forms. The integrity of the samples cannot be verified. There are no courier forms or tracking identifications. Sample authentication cannot be verified.

UOS

URS Operating Services, Inc.

Data Validation Report

Note that the laboratory forms do not contain dates or times of analysis on the result forms nor on the QC and Calibration Forms. This is not uncommon for CLP-type forms, but it means that the raw data must be spot checked to verify the calibration associations. This was performed only for any outliers listed on the Calibration or QC forms.

No shipping or receiving problems were noted in the narrative. As the client was not notified of custody or integrity issues, no further action is taken.

Blanks:

There are results reported for many of the ICB and CCBs, but none are above the MDLs recorded on the result forms (the ICB/CCB forms only note the PQLs) with the exception of molybdenum reported at 0.25 ug/L for QC set 1011004 and 0.27 ug/l for QC 1011092, 093 and 094; silver at 0.15 ug/l for QC 1011004 and 0.12 ug/L for QC 1011092, 093 and 094 for ICPMS. The highest associated blank is applied to noted data. All ICPMS data are diluted 5 to 10 x for analysis and the Blank must also be multiplied by 5 or 10 in order to apply it to the client data. Data are qualified 'UCB#', where # is the applied blank value. The EPA Qualifier is 'U'.

The laboratory notes that molybdenum was detected in the prep blank at < 2 x PQL. The RL for was raised from 0.20 ug/L to 0.40 ug/L. The client will need to determine if the elevated limits meet project criteria. The standard procedure for outlier blanks is to re-analyze the data with an acceptable blank.

Calibration:

One CCV was very slightly high for beryllium at 110.3%. This is noted for Sequence 1011097. The run logs had to be accessed as the Sequences are not noted on the Results forms which have on Batch numbers – and the Calibration forms do not have dates, times or Batch numbers. This is associated with Batch 1011092. Having a consistent association of samples to calibrations on the forms would be useful. Detected data for beryllium in batch 1011092 are qualified 'JC110.3' to indicate a slight high bias. The EPA qualifier is 'J'

Matrix Spike:

The sample results were > 4 x spike for outlier spikes for manganese, magnesium, zinc and calcium. Data are not qualified as the recovery is not statistically valid. The laboratory limits (65-125%) are wider than the CLP limits. The limits noted above are used for qualification. After consideration of the 4x recoveries, no data are qualified.

Detection Limits:

Note that the samples for ICPMS were diluted 5x to 10x. The analytes run by ICPMS were extremely high for lead, cadmium and sometimes copper. The review recommends using the ICP values that are in the raw data for these analytes, although the results were within an acceptable RPD. It is the lower values that are significantly different between the two types of analysis/instrumentation. The client will need to determine if the elevated limits meet project criteria.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
All detected data in QC set 1011092	Beryllium	J+	C110.3	5
All detected data in QC set 1011004	Silver		None, non-detect	7

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
All detected data in QC set 1011092, 093, 094	Silver	U	CB.12 (multiplied by dilution factor)	7
All detected data in QC set 1011004	Molybdenum	U	CB.25 (multiplied by dilution factor)	7
All detected data in QC set 1011092, 093, 094	Molybdenum	U	CB.27 (multiplied by dilution factor)	7

There are no rinse blanks, which is acceptable for dedicated sampling equipment.

Field duplicates were identified in the EDD and fully meet field RPD criteria of 20% RPD or $\pm 1x$ CRQL for waters.:

- UASW005 and 098
- UASW035 and 097
- UASW019 and 099

1. DELIVERABLES

All deliverables were present as specified in the Statement of Work.

Yes ___ No X

Comments: There are Deliverable Submission Forms, but no actual laboratory log-in forms. The integrity of the samples cannot be verified. There are no courier forms or tracking identifications. Sample authentication cannot be verified.

Note that the laboratory forms do not contain dates or times of analysis on the result forms nor on the QC and Calibration Forms. This is not uncommon for CLP-type forms, but it means that the raw data must be spot checked to verify the calibration associations. This was performed only for any outliers listed on the Calibration or QC forms.

2. HOLDING TIMES AND PRESERVATION CRITERIA

All technical holding times and preservation criteria were met.

Yes X No ___

Comments: The samples were analyzed within specified holding times (180 days for metals and 28 days for mercury). No temperature reading for the cooler was recorded. Per the chain of custody, there were pre-printed fields that noted the sediment samples were (to be) preserved to 4 C and the waters to pH<2, but this cannot be verified as there are no log-in forms.

No shipping or receiving problems were noted in the narrative. As the client was not notified of custody or integrity issues, no further action is taken.

3. INSTRUMENT CALIBRATIONS: STANDARDS AND BLANKS

Initial instrument calibrations were performed according to SOW requirements.

Yes X No ___

Comments: None

The instruments were calibrated daily and each time an analysis run was performed.

Yes X No ___

Comments: None.

The instruments were calibrated using one blank and the appropriate number of standards.

Yes X No ___

Comments: None.

4. SAMPLE ANALYSIS RESULTS

Sample analyses were entered correctly on Form Is.

Yes X No

Comments: Per the 10% raw data check.

5. INITIAL AND CONTINUING CALIBRATION VERIFICATION

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes X No

Comments: None

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes No X

Comments: One CCV was very slightly high for beryllium at 110.3%. This is noted for Sequence 1011097. The run logs had to be accessed as the Sequences are not noted on the Results forms which have on Batch numbers -- and the Calibration forms do not have dates, times or Batch numbers. This is associated with Batch 1011092. Having a consistent association of samples to calibrations on the forms would be useful. Detected data for beryllium in batch 1011092 are qualified 'JC110.3' to indicate a slight high bias. The EPA qualifier is 'J+'.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes X No

Comments: None.

6. CRQL CHECK STANDARD

ICP Analysis: Standards (CRI) were analyzed at the beginning of each sample analysis run and every 20 analytical samples, immediately preceding the interferences check sample analyses, but not before ICV analysis.

Yes X No NA

Comments: None.

The CRI recoveries were within 70-130% (50 - 150% for ICP: Sb, Pb, Tl; ICP/MS: Co, Mn, Zn) for required elements.

Yes X No

Comments: None.

7. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes ___ No X

Comments: There are results reported for many of the ICB and CCBs, but none are above the MDLs recorded on the result forms (the ICB/CCB forms only note the PQLs) with the exception of molybdenum reported at 0.25 ug/L for QC set 1011004 and 0.27 ug/l for QC 1011092, 093 and 094; silver at 0.15 ug/l for QC 1011004 and 0.12 ug/L for QC 1011092, 093 and 094 for ICPMS. The highest associated blank is applied to noted data. All ICPMS data are diluted 5 to 10 x for analysis and the Blank must also be multiplied by 5 or 10 in order to apply it to the client data. Data are qualified 'UCB#', where # is the applied blank value. The EPA Qualifier is 'U'.

The continuing calibration blanks were run at 10% frequency.

Yes X No ___

Comments: None.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No ___

Comments: None

All analyzed blanks were free of contamination.

Yes ___ No X

Comments: The laboratory notes that molybdenum was detected in the prep blank at < 2 x PQL. The RL for was raised from 0.20 ug/L to 0.40 ug/L. It was also detected in the calibration blanks. The client will need to determine if the elevated limits meet project criteria. The standard procedure for outlier blanks is to re-analyze the data with an acceptable blank. See calibration blank section.

8. ICP INTERFERENCE CHECK SAMPLE

The ICP interference check sample (ICS) was run at the beginning of each sample analysis run, but not prior to the ICV.

Yes X No ___

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within $\pm 2x$ the CRQL.

Yes X No ___

Comments: None.

Sample results for aluminum, calcium, iron, and magnesium were less than the ICSA values.

Yes No

Comments: None

No sample results contain potential false positives and false negatives.

Yes No

Comments: None.

9. MATRIX SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No NA

Comments: Frequency met with client samples.

The percent recoveries (%Rs) were calculated correctly.

Yes No NA

Comments: None.

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes No

Comments: The sample results were > 4 x spike for outlier spikes for manganese, magnesium, zinc and calcium. Data are not qualified as the recovery is not statistically valid. The laboratory limits (65-125%) are wider than the CLP limits. The limits noted above are used for qualification. After consideration of the 4x recoveries, no data are qualified.

10. POST DIGEST SPIKE RECOVERY

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Silver, mercury).

Yes No NA

Comments: See Section 9.0.

11. DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No NA

Comments: Duplicates and MS Duplicates are reported.

The RPDs were calculated correctly.

Yes No NA

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were < 20% (limits of <35% apply for soil/sediments/tailings samples).

Yes No NA

Comments: None.

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of < CRQL (two times CRQL for soils).

Yes No NA

Comments: None.

12. ICP-MS

The ICP MS tune met SOW requirements.

Yes No NA

Comments: The ICP MS instrument was correctly tuned prior to analysis and all tuning criteria were met. The % RSDs were within the 5% limits for the tune. The Ba/Ba⁺⁺ and Ce/CeO ratios were reported and within limits. The amu (atomic mass units) at half peak width were within limits (in the range of 0.7 - 0.8).

The minimum number of internal standards were added to the analyses and bracketed the target analyte masses.

Yes No

Comments: None.

All percent relative intensities were within 60-125%.

Yes No

Comments: Per the 10% check of project data.

13. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No

All results were within control limits.

Yes No

Comments: None

14. ICP-SERIAL DILUTION QC

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes No

Comments: None.

The serial dilution was without interference problems as defined by the SOW or NFG.

Yes No

Comments: The serial dilution %Ds were less than 10% or the original sample result was less than 50% the RL.

15. ANNUAL METHOD DETECTION LIMITS (MDL)

MDLs were provided for all elements on the target analyte list.

Yes No

Comments: Last updated February 2010

Reported MDLs met SOW requirements.

Yes No

Comments: Note that the samples for ICPMS were diluted 5x to 10x. The analytes run by ICPMS were extremely high for lead, cadmium and sometimes copper. The review recommends using the ICP values that are in the raw data for these analytes, although the results were within an acceptable RPD. It is the lower values that are significantly different between the two types of analysis/instrumentation. The client will need to determine if the elevated limits meet project criteria.

16. INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes No

Comments: Interelement corrections were not included. No action was required.

17. ICP LINEAR RANGES

ICP linear ranges were reported.

Yes No

Comments: The linear ranges were updated in February 2010.

18. PREPARATION LOG

Information on the preparation of samples for analysis was reported on laboratory bench sheets as part of the raw data deliverable.

Yes No

Comments: None.

19. ANALYSIS RUN LOG

A Form with the required information was filled out for each analysis run in the data package.

Yes No

Comments: None.

20. Additional Comments or Problems/Resolutions Not Addressed Above

Yes No

Comment:

There are no rinse blanks, which would be appropriate if dedicated equipment was used.
Field duplicates were identified in the EDD and fully meet field RPD criteria of 20% RPD or ± 1
x CRQL for waters.:
UASW005 and 098
UASW035 and 097
UASW019 and 099

INORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality. Use of additional qualifiers should be carefully considered. Definitions for all qualifiers used should be provided with each report.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." The data are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample.
- J+ - The associated numerical value is an estimated quantity but the result may be biased high.
- J- - The associated numerical value is an estimated quantity but the result may be biased low.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

ACRONYMS

CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRQL	Contract Required Quantitation Limit
CRI	CRQL standard required for ICP
CV	Cold Vapor
EPA	U.S. Environmental Protection Agency
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
ICSA	Interference Check Sample (Solution A)
ICSAB	Interference Check Sample (Solution AB)
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
MDL	Method Detection Limit
MS	Matrix Spike
MSD	MS Duplicate
NFG	EPA CLP National Functional Guidelines for Inorganic Data Review
PDS	Post Digestion Spike
QC	Quality Control
RPD	Relative Percent Difference
RPM	Regional Project Manager
RSD	Percent Relative Standard Deviation
SA	Spike Added
SAS	Special Analytical Services
SDG	Sample Delivery Group
SOW	Statement of Work
SR	Sample Result
SSR	Spiked Sample Result

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: A68	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-3	Matrix: Surface Water	Lab Number: C101101-01 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	86.2		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	54300		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	< 250	U	ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	3290		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	1940		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	614	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	2460		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	449		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	1.82		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	0.790	J	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	3.63		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	0.843	J	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	15.4		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: A72	Date / Time Sampled: 10/25/10 00:00	Workorder: C101101
EPA Tag No.: No. Tag Prefix-12	Matrix: Surface Water	Lab Number: C101101-02 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	1300		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	87500		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	8140		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	7330		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	796		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1620		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	5580		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	94.6		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	0.653	J	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	3.84		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	8.74		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC01F	Date/Time Sampled: 10/31/10 13:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-55	Matrix: Surface Water	Lab Number: C101101-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminium	69.0		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	46200		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	< 250	U	ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	4060		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	120		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	294	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	1230		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	556		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	30.8	J	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	3.09		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	25.2		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	0.620	J	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC01S	Date/ Time Sampled: 10/31/10:12:04	Workorder: C101101
EPA Tag No.: No Tag Prefix-54	Matrix: Surface Water	Lab Number: C101101-04 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	2180		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	72700		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	< 250	U	ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	9760		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	977		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	561	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	1340		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	3230		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	34.7	J	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	0.968	J	ug/L	0.500 J+	5	11/18/2010	SV	1011092
200.8	Cadmium	16.9		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	38.6		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	2.21		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	12.1		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC01T	Date/Time Sampled: 10/31/10 11:50	Workorder: C101101
EPA Tag No.: No Tag Prefix-53	Matrix: Surface Water	Lab Number: C101101-05 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	1580		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	55400		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	< 250	U	ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	7020		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	633		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	482	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	1280		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	2750		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	29.1	J	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	13.6		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	102		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	2.03		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	6.06		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC02A	Date / Time Sampled: 10/31/10 11:19	Workorder: C101101
EPA Tag No.: No Tag Prefix-52	Matrix: Surface Water	Lab Number: C101101-06 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	1430		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	62000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	< 250	U	ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	8310		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	111		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	634	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	1260		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	3080		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	39.4	J	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	10.9		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	22.3		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	2.54		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	9.47		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Certificate of Analysis

TDF #: DG-216

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: CC02D	Date / Time Sampled: 10/29/10 15:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-38	Matrix: Mine Discharge	Lab Number: C101101-07 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3300		ug/L	20.0	1	11/23/2010	SW	1011103
200.7	Calcium	211000		ug/L	100	1	11/23/2010	SW	1011103
200.7	Iron	27200		ug/L	100	1	11/23/2010	SW	1011103
200.7	Magnesium	13200		ug/L	100	1	11/23/2010	SW	1011103
200.7	Manganese	29100		ug/L	2.00	1	11/23/2010	SW	1011103
200.7	Potassium	2000		ug/L	250	1	11/23/2010	SW	1011103
200.7	Sodium	6210		ug/L	250	1	11/23/2010	SW	1011103
200.7	Zinc	32700		ug/L	10.0	1	11/23/2010	SW	1011103
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/23/2010	SV	1011104
200.8	Arsenic	2.72	J	ug/L	2.50	5	11/23/2010	SV	1011104
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/23/2010	SV	1011104
200.8	Beryllium	4.49		ug/L	0.500	5	11/23/2010	SV	1011104
200.8	Cadmium	50.9		ug/L	0.500	5	11/23/2010	SV	1011104
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/23/2010	SV	1011104
200.8	Cobalt	22.5		ug/L	0.500	5	11/23/2010	SV	1011104
200.8	Copper	20.9		ug/L	2.50	5	11/23/2010	SV	1011104
200.8	Lead	255		ug/L	0.500	5	11/23/2010	SV	1011104
200.8	Molybdenum	1.99	J	ug/L	0.500 <i>w</i>	5	11/23/2010	SV	1011104
200.8	Nickel	8.30		ug/L	2.50	5	11/23/2010	SV	1011104
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/23/2010	SV	1011104
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/23/2010	SV	1011104
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/23/2010	SV	1011104
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/23/2010	SV	1011104
2340B	Hardness	582		mg/L	2	1	11/23/2010	SW	1011103

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC02D	Date / Time Sampled: 10/29/10 15:00	Workorder: C101101
EPA Tag No.: No Tag-Prefix-42	Matrix: Mine Discharge	Lab Number: C101101-08 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3330		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	212000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	31900		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	13200		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	28700		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	2040		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	6280		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	31300		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Barium	< 100	U	ug/L	50.0	10	11/18/2010	SV	1011092
200.8	Beryllium	4.82		ug/L	1.00 ⁵⁺	10	11/18/2010	SV	1011092
200.8	Cadmium	55.0		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Cobalt	22.3		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Copper	15.3		ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Lead	271		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Nickel	6.74	J	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: CC03C	Date / Time Sampled: 10/28/10-10:30	Workorder: C101101
EPA Tag No.: No-Tag Prefix-37	Matrix: Mine Discharge	Lab Number: C101101-09 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	4620		ug/L	20.0	1	11/23/2010	SW	1011103
200.7	Calcium	442000		ug/L	100	1	11/23/2010	SW	1011103
200.7	Iron	101000		ug/L	100	1	11/23/2010	SW	1011103
200.7	Magnesium	28600		ug/L	100	1	11/23/2010	SW	1011103
200.7	Manganese	30500		ug/L	2.00	1	11/23/2010	SW	1011103
200.7	Potassium	1840		ug/L	250	1	11/23/2010	SW	1011103
200.7	Sodium	8530		ug/L	250	1	11/23/2010	SW	1011103
200.7	Zinc	15400		ug/L	10.0	1	11/23/2010	SW	1011103
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Barium	< 100	U	ug/L	50.0	10	11/23/2010	SV	1011104
200.8	Beryllium	6.45		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Cadmium	48.7		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Cobalt	102		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Copper	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Lead	98.7		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Molybdenum	1.54	J	ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Nickel	42.6		ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/23/2010	SV	1011104
2340B	Hardness	1220		mg/L	2	1	11/23/2010	SW	1011103

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC03C	Date/Time Sampled: 10/28/10 10:30	Workorder: C101101
EPA Tag No.: No Tag Prefix-41	Matrix: Mine Discharge	Lab Number: C101101-10 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	4680		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	441000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	102000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	28700		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	30700		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1860		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	8730		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	15500		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Barium	< 100	U	ug/L	50.0	10	11/18/2010	SV	1011092
200.8	Beryllium	8.40		ug/L	1.00 St	10	11/18/2010	SV	1011092
200.8	Cadmium	53.1		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Cobalt	97.4		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Copper	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Lead	107		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Nickel	38.2		ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/18/2010	SV	1011092

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000359

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC03D	Date / Time Sampled: 10/28/10 10:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-46	Matrix: Surface Water	Lab Number: C101101-11 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3040		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	450000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	95200		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	28900		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	31900		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1850		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	8800		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	15500		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Barium	< 100	U	ug/L	50.0	10	11/18/2010	SV	1011092
200.8	Beryllium	6.95		ug/L	1.00 ⁵⁺	10	11/18/2010	SV	1011092
200.8	Cadmium	42.2		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Cobalt	95.9		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Copper	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Lead	13.1		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Nickel	38.6		ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/18/2010	SV	1011092

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000360

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: CC06	Date / Time Sampled: 10/28/10 13:39	Workorder: C101101
EPA Tag No.: No Tag Prefix-36	Matrix: Mine Discharge	Lab Number: C101101-12 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	18300		ug/L	20.0	1	11/23/2010	SW	1011103
200.7	Calcium	395000		ug/L	100	1	11/23/2010	SW	1011103
200.7	Iron	71600		ug/L	100	1	11/23/2010	SW	1011103
200.7	Magnesium	22600		ug/L	100	1	11/23/2010	SW	1011103
200.7	Manganese	27800		ug/L	2.00	1	11/23/2010	SW	1011103
200.7	Potassium	1790		ug/L	250	1	11/23/2010	SW	1011103
200.7	Sodium	5260		ug/L	250	1	11/23/2010	SW	1011103
200.7	Zinc	18600		ug/L	10.0	1	11/23/2010	SW	1011103
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Barium	< 100	U	ug/L	50.0	10	11/23/2010	SV	1011104
200.8	Beryllium	5.98		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Cadmium	53.0		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Cobalt	84.4		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Copper	4210		ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Lead	5.66		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Molybdenum	< 4.00	J	ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Nickel	35.4		ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/23/2010	SV	1011104
2340B	Hardness	1080		mg/L	2	1	11/23/2010	SW	1011103

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC06	Date / Time Sampled: 10/28/10 13:39	Workorder: C101101
EPA Tag No.: No Tag Prefix-40	Matrix: Mine Discharge	Lab Number: C101101-13 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	18500		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	398000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	73700		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	22800		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	28000		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1810		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	5350		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	18700		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Barium	< 100	U	ug/L	50.0	10	11/18/2010	SV	1011092
200.8	Beryllium	7.03		ug/L	1.00 ⁵⁺	10	11/18/2010	SV	1011092
200.8	Cadmium	54.9		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Cobalt	79.1		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Copper	4030		ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Lead	6.82		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Nickel	31.2		ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CCI7	Date / Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No. Tag Prefix-5	Matrix: Surface Water	Lab Number: C101101-14 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	720		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	162000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	3230		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	8230		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	1840		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	747	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	3470		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	647		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	2.73		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	7.71		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	8.83		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	0.643	J	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	0.535	J	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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000363

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC17 DUP	Date / Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-34	Matrix: Surface Water	Lab Number: C101101-15 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	572		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	163000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	3090		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	8340		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	1860		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	752	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	3520		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	661		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	2.41		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	7.36		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	6.50		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC18	Date/Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-7	Matrix: Surface Water	Lab Number: C101101-16 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	5730		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	450000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	131000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	31400		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	43000		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1740		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	9500		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	18800		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Barium	< 100	U	ug/L	50.0	10	11/18/2010	SV	1011092
200.8	Beryllium	3.54		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Cadmium	2.54		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Cobalt	136		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Copper	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Lead	1.52	J	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Nickel	46.9		ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/18/2010	SV	1011092

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000385

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: CC19 Date / Time Sampled: 10/27/10-10:05 Workorder: C101101
 EPA Tag No.: No Tag Prefix-35 Matrix: Mine Discharge Lab Number: C101101-17 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	4990		ug/L	20.0	1	11/23/2010	SW	1011103
200.7	Calcium	434000		ug/L	100	1	11/23/2010	SW	1011103
200.7	Iron	133000		ug/L	100	1	11/23/2010	SW	1011103
200.7	Magnesium	29900		ug/L	100	1	11/23/2010	SW	1011103
200.7	Manganese	41700		ug/L	2.00	1	11/23/2010	SW	1011103
200.7	Potassium	1680		ug/L	250	1	11/23/2010	SW	1011103
200.7	Sodium	9080		ug/L	250	1	11/23/2010	SW	1011103
200.7	Zinc	18100		ug/L	10.0	1	11/23/2010	SW	1011103
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Barium	< 100	U	ug/L	50.0	10	11/23/2010	SV	1011104
200.8	Beryllium	3.70		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Cadmium	2.02		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Cobalt	136		ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Copper	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Lead	1.12	J	ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Molybdenum	< 4.00	J	ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Nickel	47.8		ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/23/2010	SV	1011104
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/23/2010	SV	1011104
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/23/2010	SV	1011104
2340B	Hardness	1210		mg/L	2	1	11/23/2010	SW	1011103

"J" Qualifier indicates an estimated value

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC19
EPA Tag No.: No Tag Prefix-39Date / Time Sampled: 10/27/10 10:05
Matrix: Mine DischargeWorkorder: C101101
Lab Number: C101101-18 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	5520		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	457000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	144000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	31600		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	44000		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1790		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	9610		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	19100		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Barium	< 100	U	ug/L	50.0	10	11/18/2010	SV	1011092
200.8	Beryllium	4.18		ug/L	1.00 J ⁺	10	11/18/2010	SV	1011092
200.8	Cadmium	1.97	J	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Cobalt	133		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Copper	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Lead	3.70		ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Nickel	46.3		ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/18/2010	SV	1011092
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/18/2010	SV	1011092
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC48	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-16	Matrix: Surface Water	Lab Number: C101101-19 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7890		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	177000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	12000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	10900		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	4580		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	1840		ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	4550		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	2340		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	1.14		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	6.57		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	22.3		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	147		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	17.4		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 2.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	11.0		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CC48 DUP	Date/Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-33	Matrix: Surface Water	Lab Number: C101101-20 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7870		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	175000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	11700		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	10900		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	4810		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1800		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	4580		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	2500		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	1.30		ug/L	0.500 JT	5	11/18/2010	SV	1011092
200.8	Cadmium	6.45		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	21.6		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	135		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	19.0		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	9.52		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: CCOPP-12	Date / Time Sampled: 10/28/10 10:59	Workorder: C101101
EPA Tag No.: No Tag Prefix-47	Matrix: Surface Water	Lab Number: C101101-21 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	2480		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	87800		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	210	J	ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	6010		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	3000		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	532	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	2890		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	4640		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	<5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	<10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	<50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	<1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	13.7		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	<5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	1.83		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	140		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	7.42		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	<1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	3.23	J	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	<5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	<2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	<5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	<10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: M34 Date / Time Sampled: 10/25/10 00:00 Workorder: C101101
 EPA Tag No.: No Tag Prefix-14 Matrix: Surface Water Lab Number: C101101-22 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	381		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	57500		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	2800		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	4860		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	327		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	629	J	ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	3300		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	185		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Cadmium	0.926	J	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	3.75		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	1.23		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW001	Date/Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No-Tag-Prefix-1	Matrix: Surface Water	Lab Number: C101101-23 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7330		ug/L	20.0	1	11/18/2010	SW	1011092
200.7	Calcium	169000		ug/L	100	1	11/18/2010	SW	1011092
200.7	Iron	10800		ug/L	100	1	11/18/2010	SW	1011092
200.7	Magnesium	10400		ug/L	100	1	11/18/2010	SW	1011092
200.7	Manganese	4760		ug/L	2.00	1	11/18/2010	SW	1011092
200.7	Potassium	1700		ug/L	250	1	11/18/2010	SW	1011092
200.7	Sodium	4450		ug/L	250	1	11/18/2010	SW	1011092
200.7	Zinc	2410		ug/L	10.0	1	11/18/2010	SW	1011092
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/18/2010	SV	1011092
200.8	Beryllium	1.17		ug/L	0.500 Jt	5	11/18/2010	SV	1011092
200.8	Cadmium	6.19		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Cobalt	20.4		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Copper	121		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Lead	17.8		ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Nickel	8.46		ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/18/2010	SV	1011092
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/18/2010	SV	1011092
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/18/2010	SV	1011092

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW002	Date/Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No. Tag-Prefix-2	Matrix: Surface Water	Lab Number: C101101-24 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7810		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	175000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	11500		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	10900		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	4650		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	1790		ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	4540		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	2370		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	0.826	J	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	6.55		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	23.7		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	148		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	17.8		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	1.04	J	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	10.6		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	0.953	J	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	5.61		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW004	Date / Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-4	Matrix: Surface Water	Lab Number: C101101-25 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	5130		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	202000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	16200		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	13100		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	10100		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	933	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	4480		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	5510		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	2.28		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	16.1		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	33.0		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	398		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	25.0		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	14.7		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW006	Date / Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-6	Matrix: Surface Water	Lab Number: C101101-26 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	9160		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	258000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	32500		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	18200		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	18500		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	987	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	5630		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	10700		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	3.61		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	30.3		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	59.4		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	796		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	44.8		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	24.8		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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000375

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW008	Date / Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-8	Matrix: Surface Water	Lab Number: C101101-27 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7940		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	238000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	30000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	16100		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	14800		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	926	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	5100		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	9230		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	2.88		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	28.7		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	46.6		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	884		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	19.3		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	20.8		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW009 Date / Time Sampled: 10/27/10 00:00 Workorder: C101101
 EPA Tag No.: No Tag Prefix-9 Matrix: Surface Water Lab Number: C101101-28 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7030		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	230000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	31400		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	15600		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	14800		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	899	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	4820		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	9350		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	<10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	<50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	3.57		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	29.1		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	49.2		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	909		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	14.6		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	<1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	328		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	<2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	<10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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000377

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW010 Date / Time Sampled: 10/27/10 00:00 Workorder: C101101
 EPA Tag No.: No Tag Prefix-10 Matrix: Surface Water Lab Number: C101101-29 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	23500		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	348000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	52900		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	24800		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	23700		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	1430		ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	5140		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	16200		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Barium	< 100	U	ug/L	50.0	10	11/22/2010	SV	1011093
200.8	Beryllium	6.34		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Cadmium	63.7		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Cobalt	83.1		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Copper	4230		ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Lead	5.93		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Nickel	39.3		ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW011	Date/ Time Sampled: 10/28/10 14:10	Workorder: C101101
EPA Tag No.: No Tag Prefix-43	Matrix: Surface Water	Lab Number: C101101-30 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	18100		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	388000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	66700		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	22300		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	26000		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	1790		ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	5240		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	17100		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Barium	< 100	U	ug/L	50.0	10	11/22/2010	SV	1011093
200.8	Beryllium	7.06		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Cadmium	53.3		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Chromium	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Cobalt	81.4		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Copper	4580		ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Lead	5.66		ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Nickel	35.8		ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Selenium	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Silver	< 5.00	U	ug/L	1.00	10	11/22/2010	SV	1011093
200.8	Thallium	< 10.0	U	ug/L	5.00	10	11/22/2010	SV	1011093
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	11/22/2010	SV	1011093

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000379

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW012	Date / Time Sampled: 10/28/10 14:25	Workorder: C101101
EPA Tag No.: No Tag Prefix-44	Matrix: Surface Water	Lab Number: C101101-31 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3820		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	52500		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	< 250	U	ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	7230		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	742		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	545	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	2040		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	924		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	0.595	J	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	4.69		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	2.56	J	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	7.94		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	291		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	4.50		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	5.44		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW013	Date / Time Sampled: 10/27/10:00:00	Workorder: C101101
EPA Tag No.: No. Tag:Prefix-11	Matrix: Surface Water	Lab Number: C101101-32 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3550		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	210000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	27700		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	14000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	12800		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	874	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	4980		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	7890		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	2.73		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	22.0		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	36.3		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	128		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	13.3		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	16.3		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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000381

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW014	Date/ Time Sampled: 10/28/10 09:45	Workorder: C101101
EPA Tag No.: No Tag Prefix-45	Matrix: Surface Water	Lab Number: C101101-33 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	4980		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	231000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	30600		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	15700		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	14900		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	920	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	5430		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	8770		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	3.03		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	25.8		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	46.0		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	121		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	16.1		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	20.2		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis 000382

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW017 Date / Time Sampled: 10/29/10 11:55 Workorder: C101101
 EPA Tag No.: No.Tag Prefix-48 Matrix: Surface Water Lab Number: C101101-34 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	2570		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	81400		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	186	J	ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	6280		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	3370		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	568	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	2610		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	4910		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	1.08		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	15.8		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	2.34		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	201		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	12.6		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	4.23	J	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW018	Date / Time Sampled: 10/29/10 13:30	Workorder: C101101
EPA Tag No.: No Tag Prefix-49	Matrix: Surface Water	Lab Number: C101101-35 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	2830		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	71600		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	413		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	6880		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	4040		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	593	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	2190		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	5950		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	0.760	J	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	19.2		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	3.02		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	240		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	11.9		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	5.71		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW019	Date / Time Sampled: 10/29/10 12:49	Workorder: C101101
EPA Tag No.: No Tag Prefix-50	Matrix: Surface Water	Lab Number: C101101-36 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	10100		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	174000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	4460		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	13600		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	21900		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1420		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	5520		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	27600		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	3.80		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	72.8		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	22.6		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	820		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	75.6		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	13.6		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW019-DUP	Date/ Time Sampled: 10/29/10 12:49	Workorder: C101101
EPA Tag No.: No. Tag Prefix-57	Matrix: Surface Water	Lab Number: C101101-37 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	10200		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	174000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	4570		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	13700		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	22000		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	1440		ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	5560		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	27700		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	3.96		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	74.2		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	22.6		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	848		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	76.6		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	13.7		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW020	Date / Time Sampled: 10/29/10 13:50	Workorder: C101101
EPA Tag No.: No Tag Prefix-51	Matrix: Surface Water	Lab Number: C101101-38 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	996		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	45100		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	< 250	U	ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	5520		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	306		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	462	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	1150		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	1920		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	8.88		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	91.1		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	4.01		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	4.42	J	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW021	Date / Time Sampled: 10/31/10 11:10	Workorder: C101101
EPA Tag No.: No Tag Prefix-58	Matrix: Surface Water	Lab Number: C101101-39 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	1520		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	55900		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	< 250	U	ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	7150		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	550		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	517	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	1260		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	2550		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	26.3	J	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	0.649	J	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	12.0		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	105		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	2.62		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	6.43		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW032	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-13	Matrix: Surface Water	Lab Number: C101101-40 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	275		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	76900		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	2630		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	5720		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	1270		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	856	J	ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	3570		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	558		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	1.76		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	6.34		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	13.9		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW034	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No-Tag Prefix-15	Matrix: Surface Water	Lab Number: C101101-41 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	530		ug/L	20.0	1	11/22/2010	SW	1011093
200.7	Calcium	91000		ug/L	100	1	11/22/2010	SW	1011093
200.7	Iron	1980		ug/L	100	1	11/22/2010	SW	1011093
200.7	Magnesium	5630		ug/L	100	1	11/22/2010	SW	1011093
200.7	Manganese	2560		ug/L	2.00	1	11/22/2010	SW	1011093
200.7	Potassium	1010		ug/L	250	1	11/22/2010	SW	1011093
200.7	Sodium	3150		ug/L	250	1	11/22/2010	SW	1011093
200.7	Zinc	1030		ug/L	10.0	1	11/22/2010	SW	1011093
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011093
200.8	Beryllium	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Cadmium	2.96		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Cobalt	7.33		ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Copper	26.1		ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Lead	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Molybdenum	0.670	J	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Nickel	2.96	J	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011093
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011093
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011093

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TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW036	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-17	Matrix: Surface Water	Lab Number: C101101-42 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7800		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	171000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	12200		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	10600		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	4390		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1780		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4460		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	2260		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	0.910	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	5.87		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	23.5		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	146		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	18.9		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	0.900	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	11.7		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	0.891	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	6.35		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW037	Date/Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-18	Matrix: Surface Water	Lab Number: C10H101-43 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7580		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	172000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	14800		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	10900		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5280		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1580		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4310		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	2800		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	0.986	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	7.38		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	24.7		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	175		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	22.4		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	0.557	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	11.5		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	4.02	J	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW039	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-19	Matrix: Surface Water	Lab Number: C101101-44 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	8320		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	165000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	17600		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11300		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5610		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1680		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4090		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3000		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	0.925	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	7.47		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	27.3		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	184		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	25.7		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	12.7		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	2.77	J	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW040	Date/Time Sampled: 10/26/10:00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-20	Matrix: Surface Water	Lab Number: C101101-45 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	17100		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	57800		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	32700		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	12600		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5010		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1300		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	2180		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	1070		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.72		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	4.41		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	59.1		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	229		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	95.6		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	33.2		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW041

Date / Time Sampled: 10/26/10 00:00

Workorder: C101101

EPA Tag No.: No Tag Prefix-21

Matrix: Surface Water

Lab Number: C101101-46 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	8090		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	171000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	17200		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11300		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5710		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1680		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4150		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3090		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.58		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	8.71		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	26.7		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	184		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	24.5		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	12.9		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW042	Date/ Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-22	Matrix: Surface Water	Lab Number: C101101-47 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7870		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	175000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	17100		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11600		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5900		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1650		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4280		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3160		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.36		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	8.14		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	25.6		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	191		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	24.1		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	12.2		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis 000396

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW043 Date/Time Sampled: 10/26/10 00:00 Workorder: C101101
EPA Tag No.: No Tag Prefix-23 Matrix: Surface Water Lab Number: C101101-48 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	225		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	304000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	19300		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	18900		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	8020		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	2450		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	9620		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	2450		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	<10.0	U	ug/L	5.00	10	11/22/2010	SV	1011094
200.8	Arsenic	<20.0	U	ug/L	5.00	10	11/22/2010	SV	1011094
200.8	Barium	<100	U	ug/L	50.0	10	11/22/2010	SV	1011094
200.8	Beryllium	1.31	J	ug/L	1.00	10	11/22/2010	SV	1011094
200.8	Cadmium	2.10		ug/L	1.00	10	11/22/2010	SV	1011094
200.8	Chromium	<10.0	U	ug/L	5.00	10	11/22/2010	SV	1011094
200.8	Cobalt	34.9		ug/L	1.00	10	11/22/2010	SV	1011094
200.8	Copper	<10.0	U	ug/L	5.00	10	11/22/2010	SV	1011094
200.8	Lead	<2.00	U	ug/L	1.00	10	11/22/2010	SV	1011094
200.8	Molybdenum	<2.00	U	ug/L	1.00	10	11/22/2010	SV	1011094
200.8	Nickel	<10.0	U	ug/L	5.00	10	11/22/2010	SV	1011094
200.8	Selenium	<10.0	U	ug/L	5.00	10	11/22/2010	SV	1011094
200.8	Silver	<5.00	U	ug/L	1.00	10	11/22/2010	SV	1011094
200.8	Thallium	<10.0	U	ug/L	5.00	10	11/22/2010	SV	1011094
200.8	Vanadium	<20.0	U	ug/L	10.0	10	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW044	Date/Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-24	Matrix: Surface Water	Lab Number: C101101-49 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	8150		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	167000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	18200		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11200		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5750		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1650		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4030		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3210		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	<10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	<50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.32		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	9.09		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	28.9		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	212		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	26.0		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	<1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	14.9		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	<2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	<5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	<10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW045	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-25	Matrix: Surface Water	Lab Number: C101101-50 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	4280		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	52700		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	268		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	9690		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	1620		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	714	J	ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	1620		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	907		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	29.0	J	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.05		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	3.79		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	20.6		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	150		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	9.44		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	13.6		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW046	Date/Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-26	Matrix: Surface Water	Lab Number: C101101-51 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	8340		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	170000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	20000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11300		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5780		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1660		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4030		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3230		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.52		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	8.60		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	28.2		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	212		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	24.8		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	13.2		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

DS
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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW047 Date/Time Sampled: 10/26/10:00:00 Workorder: C101101
 EPA Tag No.: No Tag Prefix-27 Matrix: Surface Water Lab Number: C101101-52 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	8450		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	170000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	21800		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11400		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	5860		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1680		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	3990		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3320		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	3.51	J	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.44		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	8.99		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	29.4		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	225		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	24.7		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	14.4		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW049	Date / Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-28	Matrix: Surface Water	Lab Number: C101101-53 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	8900		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	171000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	24100		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11800		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	6180		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1720		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	3870		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3510		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	5.00	J	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.27		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	9.51		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	29.8		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	239		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	25.4		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	15.3		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW050	Date/ Time Sampled: 10/26/10:00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-29	Matrix: Surface Water	Lab Number: C101101-54 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	8830		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	169000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	23900		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	11700		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	6240		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1700		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	3810		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	3560		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	4.63	J	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.50		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	9.70		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	28.7		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	235		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	25.3		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	15.2		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW054	Date/Time Sampled: 10/26/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-30	Matrix: Surface Water	Lab Number: C101101-55 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	14400		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	35400		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	27600		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	7560		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	826		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	2130		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	1230		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	1350		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	17.0		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	0.726	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	5.33		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	26.1		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	190		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	57.3		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	19.6		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #:

DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW056	Date/Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-31	Matrix: Surface Water	Lab Number: C101101-56 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	5440		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	178000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	16000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	12200		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	8750		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1100		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4280		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	4850		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.75		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	12.7		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	30.4		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	355		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	26.8		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	12.2		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW058	Date / Time Sampled: 10/27/10 00:00	Workorder: C101101
EPA Tag No.: No Tag Prefix-32	Matrix: Surface Water	Lab Number: C101101-57 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	5510		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	182000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	15900		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	12600		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	9150		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	1070		ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	4370		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	5130		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	1.52		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	13.7		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	30.4		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	366		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	27.9		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	12.6		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

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Project Name: Upper Animas - Water - Oct 2010

Certificate of Analysis

TDF #: DG-216

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASW059	Date / Time Sampled: 10/31/10 12:40	Workorder: C101101
EPA Tag No.: No Tag Prefix-56	Matrix: Surface Water	Lab Number: C101101-58 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	13200		ug/L	20.0	1	11/22/2010	SW	1011094
200.7	Calcium	17400		ug/L	100	1	11/22/2010	SW	1011094
200.7	Iron	46400		ug/L	100	1	11/22/2010	SW	1011094
200.7	Magnesium	12000		ug/L	100	1	11/22/2010	SW	1011094
200.7	Manganese	8740		ug/L	2.00	1	11/22/2010	SW	1011094
200.7	Potassium	362	J	ug/L	250	1	11/22/2010	SW	1011094
200.7	Sodium	626		ug/L	250	1	11/22/2010	SW	1011094
200.7	Zinc	24900		ug/L	10.0	1	11/22/2010	SW	1011094
200.8	Antimony	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Arsenic	26.9		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Barium	< 50.0	U	ug/L	25.0	5	11/22/2010	SV	1011094
200.8	Beryllium	0.940	J	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Cadmium	105		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Chromium	5.46		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Cobalt	25.6		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Copper	4690		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Lead	33.8		ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Molybdenum	< 1.00	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Nickel	16.4		ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Selenium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Silver	< 2.50	U	ug/L	0.500	5	11/22/2010	SV	1011094
200.8	Thallium	< 5.00	U	ug/L	2.50	5	11/22/2010	SV	1011094
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	11/22/2010	SV	1011094

"J" Qualifier indicates an estimated value

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**REGION VIII
DATA VALIDATION REPORT
INORGANIC**

Case No. / TDD No.	Site Name	Operable Unit	
C101003, C101004 / 1008-13	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	TDF No.	Laboratory DPO/Region
ESAT - TechLaw, Inc.		DG-214 water and soil	

Review Assigned Date March 28, 2011Data Validator Diane Short & Assoc. ReviewReview Completion Date March 30, 2011Report Reviewer Kent Alexander

Sample ID	Matrix	Analysis
UASE001D	Sediment	Dissolved (water) and Total Recoverable (soil) Metals by EPA Methods 200.7 and 200.8
UASE002		
UASE003		
UASE001		
UASW001	Water	
UASW001 (should be 001D)		
UAWS002		
UASW003		

DATA QUALITY STATEMENT

- Data are ACCEPTABLE according to EPA Functional guidelines with no qualifiers (flags) added by the reviewer.
- Data are UNACCEPTABLE according to EPA Functional Guidelines.
- Data are acceptable with QUALIFICATIONS noted in review.

Telephone/Communication Logs Enclosed? Yes _____ No X

CLP Project Officer Attention Required? Yes _____ No X If yes, list the items that require attention:

INORGANIC DATA VALIDATION REPORT**REVIEW NARRATIVE SUMMARY**

This data package was reviewed according to "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," (NFG) January 2010.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-20% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, TDF No. DG-214, consisted of 4 sediment samples for Total Recoverable Metals and 4 water samples for Dissolved Metals by Methods 200.7 and 200.8 by ICP. The following table lists the data qualifiers added to the sample analyses. Please see Data Qualifier Definitions, attached to the end of this report.

Deliverables:

Note that the laboratory forms do not contain times of analysis on the result forms nor on the QC and Calibration Forms. This is not uncommon for CLP-type forms, but it means that the raw data must be spot checked to verify the calibration associations. As there were no outliers, no further action is taken.

Sample Tracking:

There are Deliverable Submission Forms, but no actual laboratory log-in forms. The integrity of the samples cannot be verified. There are no courier forms or tracking identifications. Sample authentication cannot be verified. Samples were collected on 10/8/2010 and relinquished on 10/11/2010. There is no record of custody for that time period.

For the waters samples, the location ID was logged for the sample ID so the UASW001 and UASW001D distinction was not carried over into the laboratory result forms. Laboratory sample C1010004-2 should be client ID UASW001D.

No shipping or receiving problems were noted in the narrative. As the client was not notified of custody or integrity issues, no further action is taken.

Blanks:

There are results reported for many of the ICB and CCBs, but none are above the MDLs recorded on the result forms (the ICB/CCB forms only note the PQLs) with the exception of iron reported at 28.9 mg/kg for QC set 1010049 for ICP soils. All data are > 5 x Blank and no qualification is required.

The laboratory notes that cadmium was detected in the prep blank at < 2 x PQL. The result for cadmium is reported at 103 ug/kg. The RL for cadmium was raised from 20 ug/kg to 30 ug/kg. The client will need to determine if the elevated limits meet project criteria. All client data were > 5 x blank and no qualification is required.

There are no rinse blanks, which would be appropriate if dedicated equipment was used.

Interference Check:

The ICSA value for iron is 250,000 ug/l for water or 25,000 mg/kg for soil. Iron values for the sediments were greater than the ICSA, but the QC check was well within limits and no qualifications were required.

UOS

URS Operating Services, Inc.

Data Validation Report

Laboratory Control Sample:

The LCS recovery for barium was at 56%. The LCS limit noted is 0 – 152%. These are extremely wide windows and the reviewer recommends considering this low bias in the use of the barium data. Data were not, however, qualified per the EPA guidance.

Detection Limits:

Note that the sediment samples for ICP were diluted 5x and those for ICPMS were diluted 10X. The analytes run by ICPMS were extremely high for lead, arsenic and vanadium. The review recommends using the ICP values that are in the raw data for these analytes, although the results were within an acceptable RPD. It is the lower values that are significantly different between the two types of analysis/instrumentation. The client will need to determine if the elevated limits meet project criteria.

Matrix Spike

Data are qualified JMS#, where # is the spike recovery. The EPA qualifier is 'J'. Data could be biased high or low proportional to the recovery. The sample results were > 4 x spike for outlier sediment spikes for aluminum, barium, iron, manganese, magnesium, zinc and calcium. Data are not qualified as the recovery is not statistically valid. The laboratory limits (65-125%) are wider than the CLP limits. The limits noted in the NFG are used for qualification. The following table lists the spike recoveries outside control limits, samples affected, and data qualifiers:

Field Duplicates:

If the UASE001 and 001D and the UASW001 and 001D are field duplicates, they meet the field duplicate precision criteria for low level and > 5 x CRQL results.

Sample ID	Elements	Qualifiers	Reason for Qualification	Review Section
All sediment samples	Barium	J-	LCS 56% - recommended, but not applied	13
All sediment samples	Sodium	J+	MS 136%	9
All sediment samples	Titanium	J-	MS 67%	

1. DELIVERABLES

All deliverables were present as specified in the Statement of Work.

Yes ___ No X

Comments: There are Deliverable Submission Forms, but no actual laboratory log-in forms. The integrity of the samples cannot be verified. There are no courier forms or tracking identifications. Sample authentication cannot be verified.

Note that the laboratory forms do not contain times of analysis on the result forms nor on the QC and Calibration Forms. This is not uncommon for CLP-type forms, but it means that the raw data must be spot checked to verify the calibration associations. As there were no outliers, no further action is taken.

2. HOLDING TIMES AND PRESERVATION CRITERIA

All technical holding times and preservation criteria were met.

Yes X No ___

Comments: The samples were analyzed within specified holding times (180 days for metals and 28 days for mercury). No temperature reading for the cooler was recorded. Per the chain of custody, there were pre-printed fields that noted the sediment samples were (to be) preserved to 4 C and the waters to pH<2, but this cannot be verified as there are no log-in forms.

No shipping or receiving problems were noted in the narrative. As the client was not notified of custody or integrity issues, no further action is taken.

3. INSTRUMENT CALIBRATIONS: STANDARDS AND BLANKS

Initial instrument calibrations were performed according to SOW requirements.

Yes X No ___

Comments: None.

The instruments were calibrated daily and each time an analysis run was performed.

Yes X No ___

Comments: None.

The instruments were calibrated using one blank and the appropriate number of standards.

Yes X No ___

Comments: None.

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Data Validation Report

4. SAMPLE ANALYSIS RESULTS

Sample analyses were entered correctly on Form Is.

Yes No

Comments: None.

5. INITIAL AND CONTINUING CALIBRATION VERIFICATION

The initial and continuing calibration verification standards (ICV and CCV, respectively) met SOW requirements.

Yes No

Comments: None.

The calibration verification results were within 90-110% recovery for metals, 85-115% for cyanide, and 80-120% for mercury.

Yes No

Comments: None.

The continuing calibration standards were run at 10% frequency or every two hours.

Yes No

Comments: None.

6. CRQL CHECK STANDARD

ICP Analysis: Standards (CRI) were analyzed at the beginning of each sample analysis run and every 20 analytical samples, immediately preceding the interferences check sample analyses, but not before ICV analysis.

Yes No NA

Comments: None.

The CRI recoveries were within 70-130% (50 - 150% for ICP: Sb, Pb, Tl; ICP/MS: Co, Mn, Zn) for required elements.

Yes No

Comments: None.

7. BLANKS

The initial and continuing calibration blanks (ICB and CCB, respectively) met SOW requirements.

Yes No

Comments: There are results reported for many of the ICB and CCBs, but none are above the MDLs recorded on the result forms (the ICB/CCB forms only note the PQLs) with the exception of iron reported at 28.9 mg/kg for QC set 1010049 for ICP soils. All data are > 5 x Blank and no qualification is required.

The continuing calibration blanks were run at 10% frequency.

Yes X No

Comments: None.

A laboratory/preparation blank was run at the frequency of one per twenty samples, or per sample delivery group (whichever is more frequent), and for each matrix analyzed.

Yes X No

Comments: None

All analyzed blanks were free of contamination.

Yes No X

Comments: The laboratory notes that cadmium was detected in the prep blank at < 2 x PQL. The result for cadmium is reported at 103 ug/kg. The RL for cadmium was raised from 20 ug/kg to 30 ug/kg. The client will need to determine if the elevated limits meet project criteria. All client data were > 5 x blank and no qualification is required.

8. ICP INTERFERENCE CHECK SAMPLE

The ICP interference check sample (ICS) was run at the beginning of each sample analysis run, but not prior to the ICV.

Yes X No

Comments: None.

Percent recovery of the analytes in the ICS solutions were within the range of 80-120% or the result was within $\pm 2x$ the CRQL.

Yes X No

Comments: None.

Sample results for aluminum, calcium, iron, and magnesium were less than the ICESA values.

Yes No X

Comments: The ICESA value for iron is 250,000 ug/l for water or 25,000 mg/kg for soil. Iron values for the sediments were greater than the ICESA, but The QC check was well within limits and no qualifications were required.

No sample results contain potential false positives and false negatives.

Yes No

Comments: None.

9. MATRIX SPIKE SAMPLE ANALYSIS

A matrix spike sample was analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No NA

Comments: UASE001 and UASW001 were used for the MS/MSD samples.

The percent recoveries (%Rs) were calculated correctly.

Yes No NA

Comments: None.

Spike recoveries were within the range of 75-125% (an exception is granted where the sample concentration is four times the spike concentration).

Yes No

Comments: Data are qualified JMS#, where # is the spike recovery. Data could be biased high or low proportional to the recovery. The sample results were > 4 x spike for outlier sediment spikes for aluminum, barium, iron, manganese, magnesium, zinc and calcium. Data are not qualified as the recovery is not statistically valid. The laboratory limits (65-125%) are wider than the CLP limits. The limits noted above are used for qualification. The following table lists the spike recoveries outside control limits, post digestion spike recoveries, samples affected, and data qualifiers:

Element	Matrix Spike %R	Post-Digestion %R	Samples Affected	Qualifiers
Sodium	136/ 136	104%	All sediment detects	JMS136
Titanium	67/ 71	Not in post spike	All sediment samples	JMS67

10. POST DIGEST SPIKE RECOVERY

A post-digest spike was performed for those elements that did not meet the specified criteria (i.e., Pre-digestion/pre-distillation spike recovery falls outside of control limits and sample result is less than four times the spike amount added, exception: Ag, Hg).

Yes No NA

Comments: See Section 9.0.

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11. DUPLICATE SAMPLE ANALYSIS

Duplicate sample analysis was performed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes X No ___ NA ___

Comments: Duplicates and MS Duplicates are reported.

The RPDs were calculated correctly.

Yes X No ___ NA ___

Comments: None.

For sample concentrations greater than five times the CRQL, RPDs were < 20% (limits of <35% apply for soil/sediments/tailings samples).

Yes X No ___ NA ___

Comments: None.

For sample concentrations less than five times the CRQL, duplicate analysis results were within the control window of < CRQL (two times CRQL for soils).

Yes X No ___ NA ___

Comments: None.

12. ICP-MS

The ICP MS tune met SOW requirements.

Yes X No ___ NA ___

Comments: The ICP MS instrument was correctly tuned prior to analysis and all tuning criteria were met. The % RSDs were within the 5% limits for the tune. The Ba/Ba++ and Ce/CeO ratios were reported and within limits. The amu (atomic mass units) at half peak width were within limits (in the range of 0.7 - 0.8).

The minimum number of internal standards were added to the analyses and bracketed the target analyte masses.

Yes X No ___

Comments: None.

All percent relative intensities were within 60-125%.

Yes X No ___

Comments: None.

13. LABORATORY CONTROL SAMPLE

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent).

Yes No

Comments: Note that for sediments, the LCS does not contain titanium, strontium or molybdenum. This is not uncommon as the LCS is a standard reference soil and these analytes are not routinely present.

All results were within control limits.

Yes No

Comments: The LCS recovery for barium was at 56%. The LCS limit noted is 0 – 152%. These are extremely wide windows and the reviewer recommends considering this low bias in the use of the barium data. Data were not, however, qualified per the EPA guidance.

14. ICP-SERIAL DILUTION QC

A serial dilution was performed for ICP analysis with every twenty or fewer samples of a similar matrix, or one per sample delivery group, whichever is more frequent.

Yes No

Comments: None.

The serial dilution was without interference problems as defined by the SOW or NFG.

Yes No

Comments: The serial dilution %Ds were less than 10% or the original sample result was less than 50% the RL.

15. ANNUAL METHOD DETECTION LIMITS (MDL)

MDLs were provided for all elements on the target analyte list.

Yes No

Comments: Last updated February 2010

Reported MDLs met SOW requirements.

Yes No

Comments: Note that the sediment samples for ICP were diluted 5x and those for ICPMS were diluted 10X. The analytes run by ICPMS were extremely high for lead, arsenic and vanadium. The review recommends using the ICP values that are in the raw data for these analytes, although the results were within an acceptable RPD. It is the lower values that are significantly different between the two types of analysis/ instrumentation. These can be reported in a comparison table upon request. The project manager will determine if project limits are met.

16. INTERELEMENT CORRECTION FACTORS FOR ICP

Interelement corrections for ICP were reported.

Yes _____ No X

Comments: Interelement corrections were not included. No action was required.

17. ICP LINEAR RANGES

ICP linear ranges were reported.

Yes X No _____

Comments: The linear ranges were updated in February 2010.

18. PREPARATION LOG

Information on the preparation of samples for analysis was reported on laboratory bench sheets as part of the raw data deliverable.

Yes X No _____

Comments: None.

19. ANALYSIS RUN LOG

A Form with the required information was filled out for each analysis run in the data package.

Yes X No _____

Comments: None.

20. Additional Comments or Problems/Resolutions Not Addressed Above

Yes X No _____

Comment: For the water samples, the location ID was logged for the sample ID so the UASW001 and UASW001D distinction was not carried over into the laboratory result forms. Laboratory sample C1010004-2 should be client ID UASW001D.

Samples were collected on 10/8/2010 and relinquished on 10/11/2010. There is no record of custody for that time period.

If the UASE001 and 001D and the UASW001 and 001D are field duplicates, they meet the field duplicate precision criteria for low level and $> 5 \times$ CRQL results.

There are no rinse blanks, which would be appropriate if dedicated equipment was used.

INORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality. Use of additional qualifiers should be carefully considered. Definitions for all qualifiers used should be provided with each report.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." The data are unusable. Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity and is the approximate concentration of the analyte in the sample.
- J+ - The associated numerical value is an estimated quantity but the result may be biased high.
- J- - The associated numerical value is an estimated quantity but the result may be biased low.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound may or may not be present in the sample.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

ACRONYMS

CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRQL	Contract Required Quantitation Limit
CRI	CRQL standard required for ICP
CV	Cold Vapor
EPA	U.S. Environmental Protection Agency
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICS	Interference Check Sample
ICSA	Interference Check Sample (Solution A)
ICSAB	Interference Check Sample (Solution AB)
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
MDL	Method Detection Limit
MS	Matrix Spike
MSD	MS Duplicate
NFG	EPA CLP National Functional Guidelines for Inorganic Data Review
PDS	Post Digestion Spike
QC	Quality Control
RPD	Relative Percent Difference
RPM	Regional Project Manager
RSD	Percent Relative Standard Deviation
SA	Spike Added
SAS	Special Analytical Services
SDG	Sample Delivery Group
SOW	Statement of Work
SR	Sample Result
SSR	Spiked Sample Result

Project Name: Upper Animas - Rush SED - Oct 2010

Certificate of Analysis

TDF #:

DG-214

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASE001D	Date / Time Sampled: 10/08/10 00:00	Workorder: C101003
EPA Tag No.:	Matrix: Sediment	Lab Number: C101003-01 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2 / 200.8	Antimony	4230		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Arsenic	45400		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cadmium	990		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Chromium	3500		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cobalt	5360		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Lead	460000		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Molybdenum	4660		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Nickel	2840		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Selenium	2530		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Silver	2570		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Thallium	< 997	U	ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Vanadium	19000		ug/kg dry wt	997	10	10/13/2010	SV	1010049
EPA 200.2/200.7	Aluminum	8250		mg/kg dry wt	9.97	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Barium	215		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Beryllium	< 2.49	U	mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Calcium	1550		mg/kg dry wt	49.9	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Copper	116		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Iron	58400		mg/kg dry wt	49.9	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Magnesium	2630		mg/kg dry wt	49.9	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Manganese	801		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Potassium	1220		mg/kg dry wt	125	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Sodium	< 249	U	mg/kg dry wt	125	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Strontium	83.6		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Titanium	23.8		mg/kg dry wt	2.49 J-	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Zinc	339		mg/kg dry wt	4.99	5	10/12/2010	SW	1010049

Project Name: Upper Animas - Rush SED - Oct 2010

Certificate of Analysis **000422**

TDF #: DG-214

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASE002 Date / Time Sampled: 10/08/10 00:00 Workorder: C101003
 EPA Tag No.: Matrix: Sediment Lab Number: C101003-02 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2 / 200.8	Antimony	5800		ug/kg dry wt	500	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Arsenic	49600		ug/kg dry wt	500	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cadmium	674		ug/kg dry wt	99.9	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Chromium	2890		ug/kg dry wt	500	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cobalt	2600		ug/kg dry wt	99.9	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Lead	382000		ug/kg dry wt	99.9	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Molybdenum	3410		ug/kg dry wt	99.9	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Nickel	2230		ug/kg dry wt	500	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Selenium	2760		ug/kg dry wt	500	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Silver	2820		ug/kg dry wt	99.9	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Thallium	1170		ug/kg dry wt	500	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Vanadium	18300		ug/kg dry wt	999	10	10/13/2010	SV	1010049
EPA 200.2/200.7	Aluminum	5420		mg/kg dry wt	9.99	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Barium	326		mg/kg dry wt	0.999	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Beryllium	< 2.50	U	mg/kg dry wt	0.999	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Calcium	863		mg/kg dry wt	50.0	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Copper	39.5		mg/kg dry wt	0.999	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Iron	46900		mg/kg dry wt	50.0	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Magnesium	2220		mg/kg dry wt	50.0	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Manganese	235		mg/kg dry wt	0.999	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Potassium	1380		mg/kg dry wt	125	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Sodium	< 250	U	mg/kg dry wt	125	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Strontium	90.9		mg/kg dry wt	0.999	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Titanium	17.5		mg/kg dry wt	2.50	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Zinc	199		mg/kg dry wt	5.00	5	10/12/2010	SW	1010049

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Project Name: Upper Animas - Rush SED - Oct 2010

Certificate of Analysis **000423**

TDF #: DG-214

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASE003	Date / Time Sampled: 10/08/10 00:00	Workorder: C101003
EPA Tag No.:	Matrix: Sediment	Lab Number: C101003-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2 / 200.8	Antimony	1190		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Arsenic	19800		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cadmium	8840		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Chromium	4120		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cobalt	11500		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Lead	882000		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Molybdenum	7200		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Nickel	7950		ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Selenium	877	J	ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Silver	5080		ug/kg dry wt	99.7	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Thallium	503	J	ug/kg dry wt	499	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Vanadium	18000		ug/kg dry wt	997	10	10/13/2010	SV	1010049
EPA 200.2/200.7	Aluminum	9830		mg/kg dry wt	9.97	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Barium	128		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Beryllium	1.58	J	mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Calcium	3420		mg/kg dry wt	49.9	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Copper	203		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Iron	24800		mg/kg dry wt	49.9	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Magnesium	5520		mg/kg dry wt	49.9	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Manganese	8730		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Potassium	750		mg/kg dry wt	125	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Sodium	< 249	U	mg/kg dry wt	125	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Strontium	44.9		mg/kg dry wt	0.997	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Titanium	62.7		mg/kg dry wt	2.49	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Zinc	2400		mg/kg dry wt	4.99	5	10/12/2010	SW	1010049

DS
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Project Name: Upper Animas - Rush SED - Oct 2010

Certificate of Analysis

TDF #:

DG-214

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: UASE001	Date / Time Sampled: 10/08/10 00:00	Workorder: C101003
EPA Tag No.:	Matrix: Sediment	Lab Number: C101003-04 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2 / 200.8	Antimony	5410		ug/kg dry wt	494	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Arsenic	52900		ug/kg dry wt	494	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cadmium	829		ug/kg dry wt	98.8	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Chromium	3490		ug/kg dry wt	494	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Cobalt	4590		ug/kg dry wt	98.8	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Lead	531000		ug/kg dry wt	98.8	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Molybdenum	5560		ug/kg dry wt	98.8	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Nickel	2830		ug/kg dry wt	494	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Selenium	2980		ug/kg dry wt	494	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Silver	3790		ug/kg dry wt	98.8	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Thallium	643	J	ug/kg dry wt	494	10	10/13/2010	SV	1010049
EPA 200.2 / 200.8	Vanadium	19300		ug/kg dry wt	988	10	10/13/2010	SV	1010049
EPA 200.2/200.7	Aluminum	9450		mg/kg dry wt	9.88	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Barium	261		mg/kg dry wt	0.988	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Beryllium	<2.47	U	mg/kg dry wt	0.988	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Calcium	1620		mg/kg dry wt	49.4	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Copper	158		mg/kg dry wt	0.988	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Iron	63100		mg/kg dry wt	49.4	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Magnesium	2490		mg/kg dry wt	49.4	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Manganese	602		mg/kg dry wt	0.988	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Potassium	1330		mg/kg dry wt	124	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Sodium	<247	U	mg/kg dry wt	124	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Strontium	91.8		mg/kg dry wt	0.988	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Titanium	20.1		mg/kg dry wt	2.47 J	5	10/12/2010	SW	1010049
EPA 200.2/200.7	Zinc	364		mg/kg dry wt	4.94	5	10/12/2010	SW	1010049

"J" Qualifier indicates an estimated value

D5
4/11

Project Name: Upper Animas - Rush Water - Oct 2010

Certificate of Analysis

TDF #: DG-214

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: UASW001	Date / Time Sampled: 10/08/10 00:00	Workorder: C101004
EPA Tag No.:	Matrix: Water	Lab Number: C101004-01 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3240		ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Barium	18.1		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Calcium	107000		ug/L	100	1	10/11/2010	SW	1010050
200.7	Copper	88.6		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Iron	2170		ug/L	100	1	10/11/2010	SW	1010050
200.7	Magnesium	6790		ug/L	100	1	10/11/2010	SW	1010050
200.7	Manganese	3040		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Potassium	1200		ug/L	250	1	10/11/2010	SW	1010050
200.7	Sodium	3300		ug/L	250	1	10/11/2010	SW	1010050
200.7	Strontium	1230		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Thallium	< 50.0	U	ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Titanium	< 20.0	U	ug/L	5.00	1	10/11/2010	SW	1010050
200.7	Zinc	1530		ug/L	10.0	1	10/11/2010	SW	1010050
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Cadmium	4.54		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Chromium	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Cobalt	12.7		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Lead	8.38		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Molybdenum	1.23	J	ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Nickel	6.69	J	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Selenium	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Silver	1.19	J	ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	10/12/2010	SV	1010052
2340B	Hardness	295		mg/L	2	1	10/11/2010	SW	1010050

DS
4/11

Project Name: Upper Animas - Rush Water - Oct 2010

Certificate of Analysis

TDF #:

DG-214

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: UASW001 	Date/Time Sampled: 10/08/10:00:00	Workorder: C101004
EPA Tag No.:	Matrix: Water	Lab Number: C101004-02 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	3320		ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Barium	18.4		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Calcium	108000		ug/L	100	1	10/11/2010	SW	1010050
200.7	Copper	91.3		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Iron	2180		ug/L	100	1	10/11/2010	SW	1010050
200.7	Magnesium	6930		ug/L	100	1	10/11/2010	SW	1010050
200.7	Manganese	3060		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Potassium	1210		ug/L	250	1	10/11/2010	SW	1010050
200.7	Sodium	3350		ug/L	250	1	10/11/2010	SW	1010050
200.7	Strontium	1260		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Thallium	< 50.0	U	ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Titanium	< 20.0	U	ug/L	5.00	1	10/11/2010	SW	1010050
200.7	Zinc	1550		ug/L	10.0	1	10/11/2010	SW	1010050
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Cadmium	4.91		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Chromium	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Cobalt	11.5		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Lead	7.99		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Nickel	5.49	J	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Selenium	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Silver	< 5.00	U	ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	10/12/2010	SV	1010052
2340B	Hardness	299		mg/L	2	1	10/11/2010	SW	1010050

Project Name: Upper Animas - Rush Water - Oct 2010

Certificate of Analysis

TDF #: DG-214

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: UASW002	Date / Time Sampled: 10/08/10 00:00	Workorder: C101004
EPA Tag No.:	Matrix: Water	Lab Number: C101004-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	7350		ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Barium	12.5		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Calcium	165000		ug/L	100	1	10/11/2010	SW	1010050
200.7	Copper	180		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Iron	7260		ug/L	100	1	10/11/2010	SW	1010050
200.7	Magnesium	10400		ug/L	100	1	10/11/2010	SW	1010050
200.7	Manganese	4570		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Potassium	1750		ug/L	250	1	10/11/2010	SW	1010050
200.7	Sodium	4350		ug/L	250	1	10/11/2010	SW	1010050
200.7	Strontium	1950		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Thallium	< 50.0	U	ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Titanium	< 20.0	U	ug/L	5.00	1	10/11/2010	SW	1010050
200.7	Zinc	2590		ug/L	10.0	1	10/11/2010	SW	1010050
200.8	Antimony	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Cadmium	7.50		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Chromium	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Cobalt	22.5		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Lead	30.7		ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Molybdenum	< 2.00	U	ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Nickel	11.4		ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Selenium	< 10.0	U	ug/L	5.00	10	10/12/2010	SV	1010052
200.8	Silver	< 5.00	U	ug/L	1.00	10	10/12/2010	SV	1010052
200.8	Vanadium	< 20.0	U	ug/L	10.0	10	10/12/2010	SV	1010052
2340B	Hardness	456		mg/L	2	1	10/11/2010	SW	1010050

Project Name: Upper Animas - Rush Water - Oct 2010

Certificate of Analysis

TDF #: DG-214

Metals (Dissolved) by EPA 200/7000 Series Methods

Station ID: UASW003	Date / Time Sampled: 10/08/10 00:00	Workorder: C101004
EPA Tag No.:	Matrix: Water	Lab Number: C101004-04 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	Aluminum	75.3		ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Barium	25.5		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Calcium	49500		ug/L	100	1	10/11/2010	SW	1010050
200.7	Copper	3.69		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Iron	< 250	U	ug/L	100	1	10/11/2010	SW	1010050
200.7	Magnesium	3190		ug/L	100	1	10/11/2010	SW	1010050
200.7	Manganese	1480		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Potassium	639	J	ug/L	250	1	10/11/2010	SW	1010050
200.7	Sodium	2280		ug/L	250	1	10/11/2010	SW	1010050
200.7	Strontium	509		ug/L	2.00	1	10/11/2010	SW	1010050
200.7	Thallium	< 50.0	U	ug/L	20.0	1	10/11/2010	SW	1010050
200.7	Titanium	< 20.0	U	ug/L	5.00	1	10/11/2010	SW	1010050
200.7	Zinc	338		ug/L	10.0	1	10/11/2010	SW	1010050
200.8	Antimony	< 5.00	U	ug/L	2.50	5	10/12/2010	SV	1010052
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	10/12/2010	SV	1010052
200.8	Cadmium	0.640	J	ug/L	0.500	5	10/12/2010	SV	1010052
200.8	Chromium	< 5.00	U	ug/L	2.50	5	10/12/2010	SV	1010052
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	10/12/2010	SV	1010052
200.8	Lead	< 1.00	U	ug/L	0.500	5	10/12/2010	SV	1010052
200.8	Molybdenum	0.984	J	ug/L	0.500	5	10/12/2010	SV	1010052
200.8	Nickel	< 5.00	U	ug/L	2.50	5	10/12/2010	SV	1010052
200.8	Selenium	< 5.00	U	ug/L	2.50	5	10/12/2010	SV	1010052
200.8	Silver	< 2.50	U	ug/L	0.500	5	10/12/2010	SV	1010052
200.8	Vanadium	< 10.0	U	ug/L	5.00	5	10/12/2010	SV	1010052
2340B	Hardness	137		mg/L	2	1	10/11/2010	SW	1010050

"J" Qualifier indicates an estimated value

4/4/11
KSA

**REGION VIII
DATA VALIDATION REPORT
ORGANICS**

Case/TDD No.	Site Name	Operable Unit	
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	H35E5	

Review Assigned Date: November 23, 2010
 Review Completion Date: December 17, 2010

Data Validator: Lesley Boyd
 Report Reviewer: Fred Luck

Sample ID	Matrix	Analysis
H35E5	Sediment	CLP – Aroclors
H35E6		
H35E7		
H35E8		
H35E9		
H35F0		
H35F1		
H35F2		
H35F3		
H35F4		
H35F5		
H35F6		
H35F7		
H35F8		
H35F9		

Sample ID	Matrix	Analysis
H35G0	Sediment	CLP – Aroclors
H35G1		
H35G2		
H35G3		
H35G4		

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional Guidelines with no qualifiers (flags) added by the reviewer.
- () Data are UNACCEPTABLE according to EPA Functional Guidelines.
- (X) Data are acceptable with QUALIFICATIONS noted in review.

PO Attention Required? Yes _____ No X If yes, list the items that require attention:

ORGANIC DATA VALIDATION REPORT**REVIEW NARRATIVE SUMMARY**

This data package was reviewed according to the EPA document "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," June 2008.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, SDG No. H35E5, consisted of 20 sediment / mine sediment / soil samples for CLP Aroclor analyses by SOM01.2.

The following tables list data qualifiers added to the data. (Please see Data Qualifier Definitions, attached to the end of this report.)

Sample Number	Aroclor Compound	Qualifier	Reason For Qualification	Review Section
H35G1	All compounds	UJ	Excessive moisture content in sample	12

1. HOLDING TIMES AND PRESERVATION

All holding times criteria were met.

AROCLOR: Yes X No

All preservation criteria were met.

AROCLOR: Yes No X

Comments: The soil samples were extracted within 14 days from sample collection and all extracts were analyzed within 40 days from sample extraction.

According to the Chain-of-Custody record and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

2. INITIAL INSTRUMENT CALIBRATIONS

The multi-component target compound analyses were performed according to method requirements:

AROCLOR: Yes X No

Comments: None.

Initial instrument calibrations were performed according to requirements and met the specified control limits listed in the functional guidelines.

AROCLOR: Yes X No

Comments: The Mean Retention Times (RTs) for each of the three to five major peaks and the RT of the surrogates have been determined. The RT Window has been calculated as ± 0.07 for each of the three to five Aroclor peaks and ± 0.05 and ± 0.10 for the surrogates tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), respectively.

At least one chromatogram from each of the Aroclor Standards yields peaks that give reflector deflections between 50-100% of full scale.

The concentrations of the five concentration level standards containing the Aroclors was prepared at the following concentrations 100, 200, 400, 800, and 1600 mg/mL and surrogates at 5.0, 10, 20, 40, and 80 ng/mL for TCX, and 10, 20, 40, 80, and 160 ng/mL for DCB.

The percent relative standard deviations (%RSDs) for the calibration peaks used to quantitate the Aroclors were within 20%. Summary forms and raw data were evaluated.

3. CONTINUING CALIBRATION VERIFICATION

Continuing instrument calibrations were performed according to requirements and met specified control limits listed in the functional guidelines.

AROCLOR: Yes X No

Comments: Continuing calibration standards were analyzed at the required frequency.

The %Ds were less than or equal to 15% for the opening Aroclor 1016/1260 standards. All %Ds for the closing Aroclor 1016/1260 standards were less than 50%.

No more than 14 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last mid-point concentration of the Aroclor Standards that ends an analytical sequence.

No more than 12 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last sample or blank that is part of an analytical sequence. Summary forms and raw data were evaluated.

4. BLANKS

The laboratory blank analysis was performed according to method requirements and met specified control limits.

AROCLOR: Yes X No

Comments: A Method blank was extracted along with the field samples at a rate of no more than 20 field samples per method blank and analyzed on the same GC/Electronic Capture Detector (GC/ECD) used for the field samples.

An acceptable instrument blank was run at the completion of the initial calibration sequence. Also an acceptable instrument blank was run at the beginning and ending of the analytical sequence for this sample delivery group.

A sulfur cleanup was not required; therefore a sulfur cleanup blank was not required for this sample delivery group.

5. SURROGATE SPIKES

Surrogate compound recovery analysis was performed according to method requirements and results met specified control limits.

AROCLOR: Yes X No

Comments: Two surrogate spikes, tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), were added to all samples, including Matrix Spike / Matrix Spike Duplicate (MS/MSDs), Laboratory Control Samples (LCSs), and blanks.

The surrogate percent recoveries (%Rs) were all within the QC limits (30-150%) for all samples. Summary forms and raw data were evaluated.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSDs)

Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were performed according to method requirements and results met recommended recovery and precision limits.

AROCLOR: Yes No X

Comments: MS/MSD analyses were performed on sample H35G4. The percent recoveries for the Aroclor MS/MSD analyses were within QC limits, however the relative percent differences (RPDs) for the Aroclor MS/MSD analyses were all outside of QC limits. Since the percent recoveries for all of the samples were well within limits and none of the target compounds were detected in any of the field samples no qualification of the data was made. Summary forms and raw data were evaluated.

7. LABORATORY CONTROL SAMPLE (LCS)

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent). The percent recoveries for the LCS analyses were within QC limits. Summary forms and raw data were evaluated.

AROCLOR: Yes X No

Comments: None.

8. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

AROCLOR: Yes No X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

9. GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

The gel permeation chromatography (GPC) check was performed according to requirements and all spike compounds were within the specified quality control limits.

AROCLOR: Yes X No

Comments: The GPC calibration appears acceptable based upon review of the two.

10. TARGET COMPOUND IDENTIFICATION

The sample results were reviewed and all compound identifications were acceptable and met method requirements.

AROCLOR: Yes X No

Comments: No problems with the identification of the sample results were found. All retention times were met for the detected results.

None of the target analyses were identified in any of the samples. The sample extract was not diluted for any of the samples.

11. GAS CHROMATOGRAPH / MASS SPECTROMETER (GC/MS) CONFIRMATION

GC Confirmation of detected Aroclors has been confirmed.

AROCLOR: Yes No X

Comments: No targeted Aroclors were detected in any of the field samples; therefore GC/MS confirmation is not required.

12. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

The reported quantitative limits and CRQLs are accurate and unqualified

AROCLOR: Yes No X

Comments: Compound quantitations, as well as CRQLs were adjusted according to the equations provided in the method.

The percent moisture for sample H35G1 was determined to be 73%, which exceeds the 70.0% level, but is less than 90%. The results for this sample are therefore to be qualified as UJ for each of the target analytes.

13. OTHER COMMENTS NOT ADDRESSED ELSEWHERE

- 1) Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

ORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity because the Quality Control criteria were not met.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound was not detected.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000439

EPA SAMPLE NO.

H35E5

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764001
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A031,19101109B031
 % Moisture: 46. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	61.	U
11104-28-2	Aroclor-1221	61.	U
11141-16-5	Aroclor-1232	61.	U
53469-21-9	Aroclor-1242	61.	U
12672-29-6	Aroclor-1248	61.	U
11097-69-1	Aroclor-1254	61.	U
11096-82-5	Aroclor-1260	61.	U
37324-23-5	Aroclor-1262	61.	U
11100-14-4	Aroclor-1268	61.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000440

EPA SAMPLE NO.

H35E6

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764002
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A032,19101109B032
 % Moisture: 16. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	39.	U
11104-28-2	Aroclor-1221	39.	U
11141-16-5	Aroclor-1232	39.	U
53469-21-9	Aroclor-1242	39.	U
12672-29-6	Aroclor-1248	39.	U
11097-69-1	Aroclor-1254	39.	U
11096-82-5	Aroclor-1260	39.	U
37324-23-5	Aroclor-1262	39.	U
11100-14-4	Aroclor-1268	39.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000441

EPA SAMPLE NO.

H35E7

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764003
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A033,19101109B033
 % Moisture: 20. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	41.	U
11104-28-2	Aroclor-1221	41.	U
11141-16-5	Aroclor-1232	41.	U
53469-21-9	Aroclor-1242	41.	U
12672-29-6	Aroclor-1248	41.	U
11097-69-1	Aroclor-1254	41.	U
11096-82-5	Aroclor-1260	41.	U
37324-23-5	Aroclor-1262	41.	U
11100-14-4	Aroclor-1268	41.	U

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1/10/11

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000442

EPA SAMPLE NO.

H35E8

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764004
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A034,19101109B034
 % Moisture: 33. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	49.	U
11104-28-2	Aroclor-1221	49.	U
11141-16-5	Aroclor-1232	49.	U
53469-21-9	Aroclor-1242	49.	U
12672-29-6	Aroclor-1248	49.	U
11097-69-1	Aroclor-1254	49.	U
11096-82-5	Aroclor-1260	49.	U
37324-23-5	Aroclor-1262	49.	U
11100-14-4	Aroclor-1268	49.	U

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1H - FORM I ARO
AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35E9

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764005
 Sample wt/vol: 30.0 (g/mL) g _____ Lab File ID: 19101109A035,19101109B035
 % Moisture: 37. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.9 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	53.	U
11104-28-2	Aroclor-1221	53.	U
11141-16-5	Aroclor-1232	53.	U
53469-21-9	Aroclor-1242	53.	U
12672-29-6	Aroclor-1248	53.	U
11097-69-1	Aroclor-1254	53.	U
11096-82-5	Aroclor-1260	53.	U
37324-23-5	Aroclor-1262	53.	U
11100-14-4	Aroclor-1268	53.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35F0

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764006
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A036,19101109B036
 % Moisture: 27. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	46.	U
11104-28-2	Aroclor-1221	46.	U
11141-16-5	Aroclor-1232	46.	U
53469-21-9	Aroclor-1242	46.	U
12672-29-6	Aroclor-1248	46.	U
11097-69-1	Aroclor-1254	46.	U
11096-82-5	Aroclor-1260	46.	U
37324-23-5	Aroclor-1262	46.	U
11100-14-4	Aroclor-1268	46.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

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EPA SAMPLE NO.

H35F1

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764007
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A037,19101109B037
 % Moisture: 23. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	43.	U
11104-28-2	Aroclor-1221	43.	U
11141-16-5	Aroclor-1232	43.	U
53469-21-9	Aroclor-1242	43.	U
12672-29-6	Aroclor-1248	43.	U
11097-69-1	Aroclor-1254	43.	U
11096-82-5	Aroclor-1260	43.	U
37324-23-5	Aroclor-1262	43.	U
11100-14-4	Aroclor-1268	43.	U

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1H - FORM I ARO
AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35F2

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764008
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A038,19101109B038
 % Moisture: 17. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	40.	U
11104-28-2	Aroclor-1221	40.	U
11141-16-5	Aroclor-1232	40.	U
53469-21-9	Aroclor-1242	40.	U
12672-29-6	Aroclor-1248	40.	U
11097-69-1	Aroclor-1254	40.	U
11096-82-5	Aroclor-1260	40.	U
37324-23-5	Aroclor-1262	40.	U
11100-14-4	Aroclor-1268	40.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35F3

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764009
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A039,19101109B039
 % Moisture: 24. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	43.	U
11104-28-2	Aroclor-1221	43.	U
11141-16-5	Aroclor-1232	43.	U
53469-21-9	Aroclor-1242	43.	U
12672-29-6	Aroclor-1248	43.	U
11097-69-1	Aroclor-1254	43.	U
11096-82-5	Aroclor-1260	43.	U
37324-23-5	Aroclor-1262	43.	U
11100-14-4	Aroclor-1268	43.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35F4

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764010
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A040,19101109B040
 % Moisture: 25. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	44.	U
11104-28-2	Aroclor-1221	44.	U
11141-16-5	Aroclor-1232	44.	U
53469-21-9	Aroclor-1242	44.	U
12672-29-6	Aroclor-1248	44.	U
11097-69-1	Aroclor-1254	44.	U
11096-82-5	Aroclor-1260	44.	U
37324-23-5	Aroclor-1262	44.	U
11100-14-4	Aroclor-1268	44.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

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EPA SAMPLE NO.

H35F5

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod: Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764011
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A041,19101109B041
 % Moisture: 26. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	45.	U
11104-28-2	Aroclor-1221	45.	U
11141-16-5	Aroclor-1232	45.	U
53469-21-9	Aroclor-1242	45.	U
12672-29-6	Aroclor-1248	45.	U
11097-69-1	Aroclor-1254	45.	U
11096-82-5	Aroclor-1260	45.	U
37324-23-5	Aroclor-1262	45.	U
11100-14-4	Aroclor-1268	45.	U

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1H - FORM I ARO

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EPA SAMPLE NO.

H35F6

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764012
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A042,19101109B042
 % Moisture: 28. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	46.	U
11104-28-2	Aroclor-1221	46.	U
11141-16-5	Aroclor-1232	46.	U
53469-21-9	Aroclor-1242	46.	U
12672-29-6	Aroclor-1248	46.	U
11097-69-1	Aroclor-1254	46.	U
11096-82-5	Aroclor-1260	46.	U
37324-23-5	Aroclor-1262	46.	U
11100-14-4	Aroclor-1268	46.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35F7

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764013
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A043,19101109B043
 % Moisture: 41. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	56.	U
11104-28-2	Aroclor-1221	56.	U
11141-16-5	Aroclor-1232	56.	U
53469-21-9	Aroclor-1242	56.	U
12672-29-6	Aroclor-1248	56.	U
11097-69-1	Aroclor-1254	56.	U
11096-82-5	Aroclor-1260	56.	U
37324-23-5	Aroclor-1262	56.	U
11100-14-4	Aroclor-1268	56.	U

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000452

1H - FORM I ARO

AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35F8

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764014
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A044,19101109B044
 % Moisture: 41. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC. Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	56.	U
11104-28-2	Aroclor-1221	56.	U
11141-16-5	Aroclor-1232	56.	U
53469-21-9	Aroclor-1242	56.	U
12672-29-6	Aroclor-1248	56.	U
11097-69-1	Aroclor-1254	56.	U
11096-82-5	Aroclor-1260	56.	U
37324-23-5	Aroclor-1262	56.	U
11100-14-4	Aroclor-1268	56.	U

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 AROCLOR ORGANICS ANALYSIS DATA SHEET

000453

EPA SAMPLE NO.

H35F9

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764015
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A045,19101109B045
 % Moisture: 28. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	46.	U
11104-28-2	Aroclor-1221	46.	U
11141-16-5	Aroclor-1232	46.	U
53469-21-9	Aroclor-1242	46.	U
12672-29-6	Aroclor-1248	46.	U
11097-69-1	Aroclor-1254	46.	U
11096-82-5	Aroclor-1260	46.	U
37324-23-5	Aroclor-1262	46.	U
11100-14-4	Aroclor-1268	46.	U

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EPA SAMPLE NO.

H35G0

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764016
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A046,19101109B046
 % Moisture: 23. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	43.	U
11104-28-2	Aroclor-1221	43.	U
11141-16-5	Aroclor-1232	43.	U
53469-21-9	Aroclor-1242	43.	U
12672-29-6	Aroclor-1248	43.	U
11097-69-1	Aroclor-1254	43.	U
11096-82-5	Aroclor-1260	43.	U
37324-23-5	Aroclor-1262	43.	U
11100-14-4	Aroclor-1268	43.	U

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1H - FORM I ARO
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EPA SAMPLE NO.

H35G1

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764017
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A047,19101109B047
 % Moisture: 73. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	120	U
11104-28-2	Aroclor-1221	120	U
11141-16-5	Aroclor-1232	120	U
53469-21-9	Aroclor-1242	120	U
12672-29-6	Aroclor-1248	120	U
11097-69-1	Aroclor-1254	120	U
11096-82-5	Aroclor-1260	120	U
37324-23-5	Aroclor-1262	120	U
11100-14-4	Aroclor-1268	120	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

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EPA SAMPLE NO.

H35G2

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764018
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A048,19101109B048
 % Moisture: 36. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
12674-11-2	Aroclor-1016	51.	U
11104-28-2	Aroclor-1221	51.	U
11141-16-5	Aroclor-1232	51.	U
53469-21-9	Aroclor-1242	51.	U
12672-29-6	Aroclor-1248	51.	U
11097-69-1	Aroclor-1254	51.	U
11096-82-5	Aroclor-1260	51.	U
37324-23-5	Aroclor-1262	51.	U
11100-14-4	Aroclor-1268	51.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000457

EPA SAMPLE NO.

H35G3

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764019
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A049,19101109B049
 % Moisture: 19. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
12674-11-2	Aroclor-1016	41.	U
11104-28-2	Aroclor-1221	41.	U
11141-16-5	Aroclor-1232	41.	U
53469-21-9	Aroclor-1242	41.	U
12672-29-6	Aroclor-1248	41.	U
11097-69-1	Aroclor-1254	41.	U
11096-82-5	Aroclor-1260	41.	U
37324-23-5	Aroclor-1262	41.	U
11100-14-4	Aroclor-1268	41.	U

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000458

1H - FORM I ARO
AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35G4

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35E5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030764020
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101109A050,19101109B050
 % Moisture: 27. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/11/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	45.	U
11104-28-2	Aroclor-1221	45.	U
11141-16-5	Aroclor-1232	45.	U
53469-21-9	Aroclor-1242	45.	U
12672-29-6	Aroclor-1248	45.	U
11097-69-1	Aroclor-1254	45.	U
11096-82-5	Aroclor-1260	45.	U
37324-23-5	Aroclor-1262	45.	U
11100-14-4	Aroclor-1268	45.	U

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**REGION VIII
DATA VALIDATION REPORT
ORGANICS**

Case/TDD No.	Site Name	Operable Unit	
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	H35G5	

Review Assigned Date: November 23, 2010

Data Validator: Fred Luck

Review Completion Date: December 2, 2010

Report Reviewer: Lesley Boyd

Sample ID	Matrix	Analysis
H35G5	Sediment	CLP – Aroclors
H35G6		
H35G7		
H35G8		
H35G9		
H35H0		
H35H1		
H35H2		
H35H3		
H35H4		
H35H5		
H35H6		
H35H8		
H35H9		
H35J0	Sediment	

UOS

URS Operating Services, Inc.

Data Validation Report

Sample ID	Matrix	Analysis
H35J2	Mine Sediment	CLP - Aroclors
H35J3	Sediment	
H35J4	Soil - Surface	
H35J5		
H35J6		

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional Guidelines with no qualifiers (flags) added by the reviewer.
- () Data are UNACCEPTABLE according to EPA Functional Guidelines.
- (X) Data are acceptable with QUALIFICATIONS noted in review.

PO Attention Required? Yes _____ No X If yes, list the items that require attention:

ORGANIC DATA VALIDATION REPORT**REVIEW NARRATIVE SUMMARY**

This data package was reviewed according to the EPA document "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," June 2008.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, SDG No. H35G5, consisted of 20 sediment / mine sediment / soil samples for CLP Aroclor analyses by SOM01.2.

The following tables list data qualifiers added to the data. (Please see Data Qualifier Definitions, attached to the end of this report.)

Sample Number	Aroclor Compound	Qualifier	Reason For Qualification	Review Section
H35J3	All compounds	UJ	Excessive moisture content in sample	12

1. HOLDING TIMES AND PRESERVATION

All holding times criteria were met.

AROCLOR: Yes X No

All preservation criteria were met.

AROCLOR: Yes No X

Comments: The soil samples were extracted within 14 days from sample collection and all extracts were analyzed within 40 days from sample extraction.

According to the Chain-of-Custody record and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

2. INITIAL INSTRUMENT CALIBRATIONS

The multi-component target compound analyses were performed according to method requirements:

AROCLOR: Yes X No

Comments: None.

Initial instrument calibrations were performed according to requirements and met the specified control limits listed in the functional guidelines.

AROCLOR: Yes X No

Comments: The Mean Retention Times (RTs) for each of the three to five major peaks and the RT of the surrogates have been determined. The RT Window has been calculated as ± 0.07 for each of the three to five Aroclor peaks and ± 0.05 and ± 0.10 for the surrogates tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), respectively.

At least one chromatogram from each of the Aroclor Standards yields peaks that give reflector deflections between 50-100% of full scale.

The concentrations of the five concentration level standards containing the Aroclors was prepared at the following concentrations 100, 200, 400, 800, and 1600 mg/mL and surrogates at 5.0, 10, 20, 40, and 80 ng/mL for TCX, and 10, 20, 40, 80, and 160 ng/mL for DCB.

The percent relative standard deviations (%RSDs) for the calibration peaks used to quantitate the Aroclors were within 20%. Summary forms and raw data were evaluated.

3. CONTINUING CALIBRATION VERIFICATION

Continuing instrument calibrations were performed according to requirements and met specified control limits listed in the functional guidelines.

AROCLOR: Yes X No

Comments: Continuing calibration standards were analyzed at the required frequency.

The %Ds were less than or equal to 15% for the opening Aroclor 1016/1260 standards. All %Ds for the closing Aroclor 1016/1260 standards were less than 50%.

No more than 14 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last mid-point concentration of the Aroclor Standards that ends an analytical sequence.

No more than 12 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last sample or blank that is part of an analytical sequence. Summary forms and raw data were evaluated.

4. BLANKS

The laboratory blank analysis was performed according to method requirements and met specified control limits.

AROCLOR: Yes X No

Comments: A Method blank was extracted along with the field samples at a rate of no more than 20 field samples per method blank and analyzed on the same GC/Electronic Capture Detector (GC/ECD) used for the field samples.

An acceptable instrument blank was run at the completion of the initial calibration sequence. Also an acceptable instrument blank was run at the beginning and ending of the analytical sequence for this sample delivery group.

A sulfur cleanup was not required; therefore a sulfur cleanup blank was not required for this sample delivery group.

5. SURROGATE SPIKES

Surrogate compound recovery analysis was performed according to method requirements and results met specified control limits.

AROCLOR: Yes X No

Comments: Two surrogate spikes, tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), were added to all samples, including Matrix Spike / Matrix Spike Duplicate (MS/MSDs), Laboratory Control Samples (LCSs), and blanks.

The surrogate percent recoveries (%Rs) were all within the QC limits (30-150%) for all samples. Summary forms and raw data were evaluated.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSDs)

Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were performed according to method requirements and results met recommended recovery and precision limits.

AROCLOR: Yes X No

Comments: MS/MSD analyses were performed on sample H35G6. The percent recoveries and relative percent differences (RPDs) for the Aroclor MS/MSD analyses were within QC limits. Summary forms and raw data were evaluated.

7. LABORATORY CONTROL SAMPLE (LCS)

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent). The percent recoveries for the LCS analyses were within QC limits. Summary forms and raw data were evaluated.

AROCLOR: Yes X No

Comments: None.

8. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

AROCLOR: Yes No X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

9. GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

The gel permeation chromatography (GPC) check was performed according to requirements and all spike compounds were within the specified quality control limits.

AROCLOR: Yes X No

Comments: The GPC calibration appears acceptable based upon review of the two.

10. TARGET COMPOUND IDENTIFICATION

The sample results were reviewed and all compound identifications were acceptable and met method requirements.

AROCLOR: Yes X No

Comments: No problems with the identification of the sample results were found. All retention times were met for the detected results.

None of the target analyses were identified in any of the samples. The sample extract was not diluted for any of the samples.

11. GAS CHROMATOGRAPH / MASS SPECTROMETER (GC/MS) CONFIRMATION

GC Confirmation of detected Aroclors has been confirmed

AROCLOR: Yes No X

Comments: No targeted Aroclors were detected in any of the field samples; therefore GC/MS confirmation is not required.

12. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

The reported quantitative limits and CRQLs are accurate and unqualified

AROCLOR: Yes No X

Comments: Compound quantitations, as well as CRQLs were adjusted according to the equations provided in the method.

The percent moisture for sample H35J3 was determined to be 81%, which exceeds the 70.0% level, but is less than 90%. The results for this sample are therefore to be qualified as UJ for each of the target analytes.

13. OTHER COMMENTS NOT ADDRESSED ELSEWHERE

- 1) An unnumbered page was located immediately following page 75. This is the first chromatogram for sample H35J6.
- 2) Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

ORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity because the Quality Control criteria were not met.
- UJ - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound was not detected.
- NJ - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

000469

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35G5

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765001
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A028, 31101109B028
 % Moisture: 17. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
12674-11-2	Aroclor-1016	40.	U
11104-28-2	Aroclor-1221	40.	U
11141-16-5	Aroclor-1232	40.	U
53469-21-9	Aroclor-1242	40.	U
12672-29-6	Aroclor-1248	40.	U
11097-69-1	Aroclor-1254	40.	U
11096-82-5	Aroclor-1260	40.	U
37324-23-5	Aroclor-1262	40.	U
11100-14-4	Aroclor-1268	40.	U

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000470

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35G6

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765002
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A029,31101109B029
 % Moisture: 27. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	45.	U
11104-28-2	Aroclor-1221	45.	U
11141-16-5	Aroclor-1232	45.	U
53469-21-9	Aroclor-1242	45.	U
12672-29-6	Aroclor-1248	45.	U
11097-69-1	Aroclor-1254	45.	U
11096-82-5	Aroclor-1260	45.	U
37324-23-5	Aroclor-1262	45.	U
11100-14-4	Aroclor-1268	45.	U

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000471

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35G7

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765005
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A032,31101109B032
 % Moisture: 62. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	87.	U
11104-28-2	Aroclor-1221	87.	U
11141-16-5	Aroclor-1232	87.	U
53469-21-9	Aroclor-1242	87.	U
12672-29-6	Aroclor-1248	87.	U
11097-69-1	Aroclor-1254	87.	U
11096-82-5	Aroclor-1260	87.	U
37324-23-5	Aroclor-1262	87.	U
11100-14-4	Aroclor-1268	87.	U

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1/10/11

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000472

EPA SAMPLE NO.

H35G8

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765006
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A033, 31101109B033
 % Moisture: 22. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	42.	U
11104-28-2	Aroclor-1221	42.	U
11141-16-5	Aroclor-1232	42.	U
53469-21-9	Aroclor-1242	42.	U
12672-29-6	Aroclor-1248	42.	U
11097-69-1	Aroclor-1254	42.	U
11096-82-5	Aroclor-1260	42.	U
37324-23-5	Aroclor-1262	42.	U
11100-14-4	Aroclor-1268	42.	U

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1/10/11

000473

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35G9

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765007
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A034, 31101109B034
 % Moisture: 55. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	74.	U
11104-28-2	Aroclor-1221	74.	U
11141-16-5	Aroclor-1232	74.	U
53469-21-9	Aroclor-1242	74.	U
12672-29-6	Aroclor-1248	74.	U
11097-69-1	Aroclor-1254	74.	U
11096-82-5	Aroclor-1260	74.	U
37324-23-5	Aroclor-1262	74.	U
11100-14-4	Aroclor-1268	74.	U

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 1/10/11

000474

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H0

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765008
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A035, 31101109B035
 % Moisture: 44. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	58.	U
11104-28-2	Aroclor-1221	58.	U
11141-16-5	Aroclor-1232	58.	U
53469-21-9	Aroclor-1242	58.	U
12672-29-6	Aroclor-1248	58.	U
11097-69-1	Aroclor-1254	58.	U
11096-82-5	Aroclor-1260	58.	U
37324-23-5	Aroclor-1262	58.	U
11100-14-4	Aroclor-1268	58.	U

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11/10/11

000475

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H1

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765009
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A036,31101109B036
 % Moisture: 36. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	52.	U
11104-28-2	Aroclor-1221	52.	U
11141-16-5	Aroclor-1232	52.	U
53469-21-9	Aroclor-1242	52.	U
12672-29-6	Aroclor-1248	52.	U
11097-69-1	Aroclor-1254	52.	U
11096-82-5	Aroclor-1260	52.	U
37324-23-5	Aroclor-1262	52.	U
11100-14-4	Aroclor-1268	52.	U

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000476

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H2

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765010
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A037, 31101109B037
 % Moisture: 60. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	82.	U
11104-28-2	Aroclor-1221	82.	U
11141-16-5	Aroclor-1232	82.	U
53469-21-9	Aroclor-1242	82.	U
12672-29-6	Aroclor-1248	82.	U
11097-69-1	Aroclor-1254	82.	U
11096-82-5	Aroclor-1260	82.	U
37324-23-5	Aroclor-1262	82.	U
11100-14-4	Aroclor-1268	82.	U

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 11/10/11

000477

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H3

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765011
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A038, 31101109B038
 % Moisture: 24. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	44.	U
11104-28-2	Aroclor-1221	44.	U
11141-16-5	Aroclor-1232	44.	U
53469-21-9	Aroclor-1242	44.	U
12672-29-6	Aroclor-1248	44.	U
11097-69-1	Aroclor-1254	44.	U
11096-82-5	Aroclor-1260	44.	U
37324-23-5	Aroclor-1262	44.	U
11100-14-4	Aroclor-1268	44.	U

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 11/10/11

000478

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H4

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765012
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A039, 31101109B039
 % Moisture: 54. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	71.	U
11104-28-2	Aroclor-1221	71.	U
11141-16-5	Aroclor-1232	71.	U
53469-21-9	Aroclor-1242	71.	U
12672-29-6	Aroclor-1248	71.	U
11097-69-1	Aroclor-1254	71.	U
11096-82-5	Aroclor-1260	71.	U
37324-23-5	Aroclor-1262	71.	U
11100-14-4	Aroclor-1268	71.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H5

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765013
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A040,31101109B040
 % Moisture: 45. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	60.	U
11104-28-2	Aroclor-1221	60.	U
11141-16-5	Aroclor-1232	60.	U
53469-21-9	Aroclor-1242	60.	U
12672-29-6	Aroclor-1248	60.	U
11097-69-1	Aroclor-1254	60.	U
11096-82-5	Aroclor-1260	60.	U
37324-23-5	Aroclor-1262	60.	U
11100-14-4	Aroclor-1268	60.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H6

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765014
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A041, 31101109B041
 % Moisture: 52. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	69.	U
11104-28-2	Aroclor-1221	69.	U
11141-16-5	Aroclor-1232	69.	U
53469-21-9	Aroclor-1242	69.	U
12672-29-6	Aroclor-1248	69.	U
11097-69-1	Aroclor-1254	69.	U
11096-82-5	Aroclor-1260	69.	U
37324-23-5	Aroclor-1262	69.	U
11100-14-4	Aroclor-1268	69.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H8

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765015
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A042, 31101109B042
 % Moisture: 60. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	82.	U
11104-28-2	Aroclor-1221	82.	U
11141-16-5	Aroclor-1232	82.	U
53469-21-9	Aroclor-1242	82.	U
12672-29-6	Aroclor-1248	82.	U
11097-69-1	Aroclor-1254	82.	U
11096-82-5	Aroclor-1260	82.	U
37324-23-5	Aroclor-1262	82.	U
11100-14-4	Aroclor-1268	82.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

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EPA SAMPLE NO.

H35H9

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765016
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A043;31101109B043
 % Moisture: 67. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	99.	U
11104-28-2	Aroclor-1221	99.	U
11141-16-5	Aroclor-1232	99.	U
53469-21-9	Aroclor-1242	99.	U
12672-29-6	Aroclor-1248	99.	U
11097-69-1	Aroclor-1254	99.	U
11096-82-5	Aroclor-1260	99.	U
37324-23-5	Aroclor-1262	99.	U
11100-14-4	Aroclor-1268	99.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35J0

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765017
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A044, 31101109B044
 % Moisture: 21. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	42.	U
11104-28-2	Aroclor-1221	42.	U
11141-16-5	Aroclor-1232	42.	U
53469-21-9	Aroclor-1242	42.	U
12672-29-6	Aroclor-1248	42.	U
11097-69-1	Aroclor-1254	42.	U
11096-82-5	Aroclor-1260	42.	U
37324-23-5	Aroclor-1262	42.	U
11100-14-4	Aroclor-1268	42.	U

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1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35J2

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765018
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A045,31101109B045
 % Moisture: 63. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	89.	U
11104-28-2	Aroclor-1221	89.	U
11141-16-5	Aroclor-1232	89.	U
53469-21-9	Aroclor-1242	89.	U
12672-29-6	Aroclor-1248	89.	U
11097-69-1	Aroclor-1254	89.	U
11096-82-5	Aroclor-1260	89.	U
37324-23-5	Aroclor-1262	89.	U
11100-14-4	Aroclor-1268	89.	U

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1H - FORM I ARO
AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35J3

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765019
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A046,31101109B046
 % Moisture: 81. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	170	U
11104-28-2	Aroclor-1221	170	U
11141-16-5	Aroclor-1232	170	U
53469-21-9	Aroclor-1242	170	U
12672-29-6	Aroclor-1248	170	U
11097-69-1	Aroclor-1254	170	U
11096-82-5	Aroclor-1260	170	U
37324-23-5	Aroclor-1262	170	U
11100-14-4	Aroclor-1268	170	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

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EPA SAMPLE NO.

H35J4

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765020
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A047, 31101109B047
 % Moisture: 15. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.9 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	39.	U
11104-28-2	Aroclor-1221	39.	U
11141-16-5	Aroclor-1232	39.	U
53469-21-9	Aroclor-1242	39.	U
12672-29-6	Aroclor-1248	39.	U
11097-69-1	Aroclor-1254	39.	U
11096-82-5	Aroclor-1260	39.	U
37324-23-5	Aroclor-1262	39.	U
11100-14-4	Aroclor-1268	39.	U

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000487

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35J5

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765021
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A048, 31101109B048
 % Moisture: 16. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.9 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	39.	U
11104-28-2	Aroclor-1221	39.	U
11141-16-5	Aroclor-1232	39.	U
53469-21-9	Aroclor-1242	39.	U
12672-29-6	Aroclor-1248	39.	U
11097-69-1	Aroclor-1254	39.	U
11096-82-5	Aroclor-1260	39.	U
37324-23-5	Aroclor-1262	39.	U
11100-14-4	Aroclor-1268	39.	U

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11/10/11

000488

1H - FORM I ARO
AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35J6

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35G5
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030765022
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 31101109A049,31101109B049
 % Moisture: 35. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/10/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	51.	U
11104-28-2	Aroclor-1221	51.	U
11141-16-5	Aroclor-1232	51.	U
53469-21-9	Aroclor-1242	51.	U
12672-29-6	Aroclor-1248	51.	U
11097-69-1	Aroclor-1254	51.	U
11096-82-5	Aroclor-1260	51.	U
37324-23-5	Aroclor-1262	51.	U
11100-14-4	Aroclor-1268	51.	U

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**REGION VIII
DATA VALIDATION REPORT
ORGANICS**

Case/TDD No.	Site Name	Operable Unit	
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	H35H7	

Review Assigned Date: November 23, 2010Data Validator: Fred LuckReview Completion Date: December 14, 2010Report Reviewer: Lesley Struthers

Sample ID	Matrix	Analysis		
H35H7	Sediment	CLP - Aroclors		
H35J7	Soil - Surface			
H35J8				
H35J9				
H35K0				
H35K1				
H35K2				
H35K3				
H35K4				
H35K5				
H35K6				
H35K7				
H35K8			Sediment	
H35K9				
H35L0				
H35L1				

DATA QUALITY STATEMENT

- Data are ACCEPTABLE according to EPA Functional Guidelines with no qualifiers (flags) added by the reviewer.
- Data are UNACCEPTABLE according to EPA Functional Guidelines.
- Data are acceptable with QUALIFICATIONS noted in review.

PO Attention Required? Yes _____ No X If yes, list the items that require attention:

ORGANIC DATA VALIDATION REPORT**REVIEW NARRATIVE SUMMARY**

This data package was reviewed according to the EPA document "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," June 2008.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, SDG No. H35H7, consisted of 16 sediment / surface soil samples for CLP Aroclor analyses by SOM01.2.

The following tables list data qualifiers added to the data. (Please see Data Qualifier Definitions, attached to the end of this report.)

Sample Number	Aroclor Compound	Qualifier	Reason For Qualification	Review Section
H35K9	All compounds	UJ	Excessive moisture content in sample	12

1. HOLDING TIMES AND PRESERVATION

All holding times criteria were met.

AROCLOR: Yes X No

All preservation criteria were met.

AROCLOR: Yes No X

Comments: The soil samples were extracted within 14 days from sample collection and all extracts were analyzed within 40 days from sample extraction.

According to the Chain-of-Custody record and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

2. INITIAL INSTRUMENT CALIBRATIONS

The multi-component target compound analyses were performed according to method requirements:

AROCLOR: Yes X No

Comments: None.

Initial instrument calibrations were performed according to requirements and met the specified control limits listed in the functional guidelines.

AROCLOR: Yes X No

Comments: The Mean Retention Times (RTs) for each of the three to five major peaks and the RT of the surrogates have been determined. The RT Window has been calculated as ± 0.07 for each of the three to five Aroclor peaks and ± 0.05 and ± 0.10 for the surrogates tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), respectively.

At least one chromatogram from each of the Aroclor Standards yields peaks that give reflector deflections between 50-100% of full scale.

The concentrations of the five concentration level standards containing the Aroclors was prepared at the following concentrations 100, 200, 400, 800, and 1600 mg/mL and surrogates at 5.0, 10, 20, 40, and 80 ng/mL for TCX, and 10, 20, 40, 80, and 160 ng/mL for DCB.

The percent relative standard deviations (%RSDs) for the calibration peaks used to quantitate the Aroclors were within 20%. Summary forms and raw data were evaluated.

3. CONTINUING CALIBRATION VERIFICATION

Continuing instrument calibrations were performed according to requirements and met specified control limits listed in the functional guidelines.

AROCLOR: Yes X No _____

Comments: Continuing calibration standards were analyzed at the required frequency.

The %Ds were less than or equal to 15% for the opening Aroclor 1016/1260 standards. All %Ds for the closing Aroclor 1016/1260 standards were less than 50%.

No more than 14 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last mid-point concentration of the Aroclor Standards that ends an analytical sequence.

No more than 12 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last sample or blank that is part of an analytical sequence. Summary forms and raw data were evaluated.

4. BLANKS

The laboratory blank analysis was performed according to method requirements and met specified control limits.

AROCLOR: Yes X No _____

Comments: A Method blank was extracted along with the field samples at a rate of no more than 20 field samples per method blank and analyzed on the same GC/Electronic Capture Detector (GC/ECD) used for the field samples.

An acceptable instrument blank was run at the completion of the initial calibration sequence. Also an acceptable instrument blank was run at the beginning and ending of the analytical sequence for this sample delivery group.

A sulfur cleanup was not required; therefore a sulfur cleanup blank was not required for this sample delivery group.

5. SURROGATE SPIKES

Surrogate compound recovery analysis was performed according to method requirements and results met specified control limits.

AROCLOR: Yes X No

Comments: Two surrogate spikes, tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), were added to all samples, including Matrix Spike / Matrix Spike Duplicate (MS/MSDs), Laboratory Control Samples (LCSs), and blanks.

The surrogate percent recoveries (%Rs) were all within the QC limits (30-150%) for all samples. Summary forms and raw data were evaluated.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSDs)

Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were performed according to method requirements and results met recommended recovery and precision limits.

AROCLOR: Yes X No

Comments: MS/MSD analyses were performed on sample H35H7. The percent recoveries and relative percent differences (RPDs) for the Aroclor MS/MSD analyses were within QC limits. Summary forms and raw data were evaluated.

7. LABORATORY CONTROL SAMPLE (LCS)

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent). The percent recoveries for the LCS analyses were within QC limits. Summary forms and raw data were evaluated.

AROCLOR: Yes X No

Comments: None.

8. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

AROCLOR: Yes No X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

9. GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

The gel permeation chromatography (GPC) check was performed according to requirements and all spike compounds were within the specified quality control limits.

AROCLOR: Yes X No

Comments: The GPC calibration appears acceptable based upon review of the two.

10. TARGET COMPOUND IDENTIFICATION

The sample results were reviewed and all compound identifications were acceptable and met method requirements.

AROCLOR: Yes X No

Comments: No problems with the identification of the sample results were found. All retention times were met for the detected results.

The chromatograms do display the largest peak of any detected Aroclors at less than full scale. The sample extract was not diluted for any of the samples.

11. GAS CHROMATOGRAPH / MASS SPECTROMETOR (GC/MS) CONFIRMATION

GC Confirmation of detected Aroclors has been confirmed

AROCLOR: Yes No X

Comments: The on-column concentrations for each individual peak belonging to an Aroclor were reviewed for the raw data associated with each Form I ARO for the SDG. None of these raw concentrations equaled or exceeded 10 ng/ μ L, which equates to 10 μ g/mL, therefore none of the on-column concentrations are adequate to necessitate approaching the Region to obtain permission to perform GC/MS confirmation.

12. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

The reported quantitative limits and CRQLs are accurate and unqualified

AROCLOR: Yes No X

Comments: Compound quantitations, as well as CRQLs were adjusted according to the equations provided in the method.

The percent moisture for sample H35K9 was determined to be 81%, which exceeds the 70.0% level, but is less than 90%. The results for this sample are therefore to be qualified as UJ for each of the target analytes.

13. OTHER COMMENTS NOT ADDRESSED ELSEWHERE

- 1) Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

ORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity because the Quality Control criteria were not met.
- U J - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound was not detected.
- N J - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

000498

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35H7

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766001
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A035, 20101108B035
 % Moisture: 18. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	40.	U
11104-28-2	Aroclor-1221	40.	U
11141-16-5	Aroclor-1232	40.	U
53469-21-9	Aroclor-1242	40.	U
12672-29-6	Aroclor-1248	40.	U
11097-69-1	Aroclor-1254	40.	U
11096-82-5	Aroclor-1260	40.	U
37324-23-5	Aroclor-1262	40.	U
11100-14-4	Aroclor-1268	40.	U

K₃A
 11/01/11

000499

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35J7

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766004
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A038,20101108B038
 % Moisture: 35. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	51.	U
11104-28-2	Aroclor-1221	51.	U
11141-16-5	Aroclor-1232	51.	U
53469-21-9	Aroclor-1242	51.	U
12672-29-6	Aroclor-1248	51.	U
11097-69-1	Aroclor-1254	51.	U
11096-82-5	Aroclor-1260	51.	U
37324-23-5	Aroclor-1262	51.	U
11100-14-4	Aroclor-1268	51.	U

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 11/04/11

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000500

EPA SAMPLE NO.

H35J8

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766005
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A039,20101108B039
 % Moisture: 22. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.5 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	42.	U
11104-28-2	Aroclor-1221	42.	U
11141-16-5	Aroclor-1232	42.	U
53469-21-9	Aroclor-1242	42.	U
12672-29-6	Aroclor-1248	42.	U
11097-69-1	Aroclor-1254	42.	U
11096-82-5	Aroclor-1260	42.	U
37324-23-5	Aroclor-1262	42.	U
11100-14-4	Aroclor-1268	42.	U

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 1/10/11

000501

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35J9

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766006
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A040, 20101108B040
 % Moisture: 34. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
12674-11-2	Aroclor-1016	50.	U
11104-28-2	Aroclor-1221	50.	U
11141-16-5	Aroclor-1232	50.	U
53469-21-9	Aroclor-1242	50.	U
12672-29-6	Aroclor-1248	50.	U
11097-69-1	Aroclor-1254	50.	U
11096-82-5	Aroclor-1260	50.	U
37324-23-5	Aroclor-1262	50.	U
11100-14-4	Aroclor-1268	50.	U

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000502

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K0

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766007
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A041, 20101108B041
 % Moisture: 4.5 Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	35.	U
11104-28-2	Aroclor-1221	35.	U
11141-16-5	Aroclor-1232	35.	U
53469-21-9	Aroclor-1242	35.	U
12672-29-6	Aroclor-1248	35.	U
11097-69-1	Aroclor-1254	35.	U
11096-82-5	Aroclor-1260	35.	U
37324-23-5	Aroclor-1262	35.	U
11100-14-4	Aroclor-1268	35.	U

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 1/10/11

000503

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K1

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766008
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A042, 20101108B042
 % Moisture: 12. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	38.	U
11104-28-2	Aroclor-1221	38.	U
11141-16-5	Aroclor-1232	38.	U
53469-21-9	Aroclor-1242	38.	U
12672-29-6	Aroclor-1248	38.	U
11097-69-1	Aroclor-1254	38.	U
11096-82-5	Aroclor-1260	38.	U
37324-23-5	Aroclor-1262	38.	U
11100-14-4	Aroclor-1268	38.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K2

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766009
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A043, 20101108B043
 % Moisture: 11. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	37.	U
11104-28-2	Aroclor-1221	37.	U
11141-16-5	Aroclor-1232	37.	U
53469-21-9	Aroclor-1242	37.	U
12672-29-6	Aroclor-1248	37.	U
11097-69-1	Aroclor-1254	37.	U
11096-82-5	Aroclor-1260	37.	U
37324-23-5	Aroclor-1262	37.	U
11100-14-4	Aroclor-1268	37.	U

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1H - FORM I ARO

AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K3

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766010
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A044;20101108B044
 % Moisture: 6.5 Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	35.	U
11104-28-2	Aroclor-1221	35.	U
11141-16-5	Aroclor-1232	35.	U
53469-21-9	Aroclor-1242	35.	U
12672-29-6	Aroclor-1248	12.	J
11097-69-1	Aroclor-1254	35.	U
11096-82-5	Aroclor-1260	35.	U
37324-23-5	Aroclor-1262	35.	U
11100-14-4	Aroclor-1268	35.	U

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1H - FORM I ARO

AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K4

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766011
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A045, 20101108B045
 % Moisture: 10. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	37.	U
11104-28-2	Aroclor-1221	37.	U
11141-16-5	Aroclor-1232	37.	U
53469-21-9	Aroclor-1242	37.	U
12672-29-6	Aroclor-1248	37.	U
11097-69-1	Aroclor-1254	37.	U
11096-82-5	Aroclor-1260	37.	U
37324-23-5	Aroclor-1262	37.	U
11100-14-4	Aroclor-1268	37.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K5

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATAAC Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766012
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A046,20101108B046
 % Moisture: 6.6 Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	35.	U
11104-28-2	Aroclor-1221	35.	U
11141-16-5	Aroclor-1232	35.	U
53469-21-9	Aroclor-1242	35.	U
12672-29-6	Aroclor-1248	35.	U
11097-69-1	Aroclor-1254	35.	U
11096-82-5	Aroclor-1260	35.	U
37324-23-5	Aroclor-1262	35.	U
11100-14-4	Aroclor-1268	35.	U

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000508

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K6

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766013
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A047, 20101108B047
 % Moisture: 9.6 Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
12674-11-2	Aroclor-1016	36.	U
11104-28-2	Aroclor-1221	36.	U
11141-16-5	Aroclor-1232	36.	U
53469-21-9	Aroclor-1242	36.	U
12672-29-6	Aroclor-1248	36.	U
11097-69-1	Aroclor-1254	36.	U
11096-82-5	Aroclor-1260	36.	U
37324-23-5	Aroclor-1262	36.	U
11100-14-4	Aroclor-1268	36.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K7

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766014
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A048,20101108B048
 % Moisture: 16. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	39.	U
11104-28-2	Aroclor-1221	39.	U
11141-16-5	Aroclor-1232	39.	U
53469-21-9	Aroclor-1242	39.	U
12672-29-6	Aroclor-1248	39.	U
11097-69-1	Aroclor-1254	39.	U
11096-82-5	Aroclor-1260	39.	U
37324-23-5	Aroclor-1262	39.	U
11100-14-4	Aroclor-1268	39.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000510

EPA SAMPLE NO.

H35K8

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766015
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A049,20101108B049
 % Moisture: 25. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.5 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	44.	U
11104-28-2	Aroclor-1221	44.	U
11141-16-5	Aroclor-1232	44.	U
53469-21-9	Aroclor-1242	44.	U
12672-29-6	Aroclor-1248	44.	U
11097-69-1	Aroclor-1254	44.	U
11096-82-5	Aroclor-1260	44.	U
37324-23-5	Aroclor-1262	44.	U
11100-14-4	Aroclor-1268	44.	U

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1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35K8

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766015
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A049,20101108B049
 % Moisture: 25. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.5 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
12674-11-2	Aroclor-1016	44.	U
11104-28-2	Aroclor-1221	44.	U
11141-16-5	Aroclor-1232	44.	U
53469-21-9	Aroclor-1242	44.	U
12672-29-6	Aroclor-1248	44.	U
11097-69-1	Aroclor-1254	44.	U
11096-82-5	Aroclor-1260	44.	U
37324-23-5	Aroclor-1262	44.	U
11100-14-4	Aroclor-1268	44.	U

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1H - FORM I ARO
AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
H35K9

Lab Name: ALS Laboratory Group Contract: EPW05026
Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766016
Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A050, 20101108B050
% Moisture: 80. Decanted: (Y/N) N Date Received: 11/03/2010
Extraction: (Type) SONC Date Extracted: 11/04/2010
Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q	
12674-11-2	Aroclor-1016	160	U	UI
11104-28-2	Aroclor-1221	160	U	UI
11141-16-5	Aroclor-1232	160	U	UI
53469-21-9	Aroclor-1242	160	U	UI
12672-29-6	Aroclor-1248	160	U	UI
11097-69-1	Aroclor-1254	160	U	UI
11096-82-5	Aroclor-1260	160	U	UI
37324-23-5	Aroclor-1262	160	U	UI
11100-14-4	Aroclor-1268	160	U	UI

KA
11/0/11

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

819000

EPA SAMPLE NO.

H35L0

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766017
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A051,20101108B051
 % Moisture: 19. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/kg	Q
12674-11-2	Aroclor-1016	41.	U
11104-28-2	Aroclor-1221	41.	U
11141-16-5	Aroclor-1232	41.	U
53469-21-9	Aroclor-1242	41.	U
12672-29-6	Aroclor-1248	41.	U
11097-69-1	Aroclor-1254	41.	U
11096-82-5	Aroclor-1260	41.	U
37324-23-5	Aroclor-1262	41.	U
11100-14-4	Aroclor-1268	41.	U

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000514

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H35L1

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA Case No.: 40755 Mod. Ref No.: _____ SDG No.: H35H7
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030766018
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 20101108A052,20101108B052
 % Moisture: 19. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/09/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) N
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	41.	U
11104-28-2	Aroclor-1221	41.	U
11141-16-5	Aroclor-1232	41.	U
53469-21-9	Aroclor-1242	41.	U
12672-29-6	Aroclor-1248	41.	U
11097-69-1	Aroclor-1254	41.	U
11096-82-5	Aroclor-1260	41.	U
37324-23-5	Aroclor-1262	41.	U
11100-14-4	Aroclor-1268	41.	U

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**REGION VIII
DATA VALIDATION REPORT
ORGANICS**

Case/TDD No.	Site Name	Operable Unit	
40755 / 1008-16	Upper Animas Mining District		
RPM/OSC Name			
Sabrina Forrest			
Contractor Laboratory	Contract No.	SDG No.	Laboratory DPO/Region
ALS Laboratory Group	EPW05026	H36L0	

Review Assigned Date: November 23, 2010Data Validator: Lesley BoydReview Completion Date: December 17, 2010Report Reviewer: Fred Luck

Sample ID	Matrix	Analysis
H36L0	Sediment	CLP – Aroclors
H36L1		
H36L2		
H36L3		
H36L4		
H36L5		
H36L6		
H36L7		
H36L9		

UOS

URS Operating Services, Inc.

Data Validation Report

DATA QUALITY STATEMENT

- () Data are ACCEPTABLE according to EPA Functional Guidelines with no qualifiers (flags) added by the reviewer.
- () Data are UNACCEPTABLE according to EPA Functional Guidelines.
- (X) Data are acceptable with QUALIFICATIONS noted in review.

PO Attention Required? Yes _____ No X If yes, list the items that require attention:

ORGANIC DATA VALIDATION REPORT**REVIEW NARRATIVE SUMMARY**

This data package was reviewed according to the EPA document "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," June 2008.

Raw data were reviewed for completeness and transcription accuracy onto the summary forms. Approximately 10-15% of the results reported in each of the samples, calibrations, and QC analyses were recalculated and verified. If problems were identified during the recalculation of results, a more thorough calculation check was performed.

The data package, SDG No. H36L0, consisted of 9 sediment samples for CLP Aroclor analyses by SOM01.2.

The following tables list data qualifiers added to the data. (Please see Data Qualifier Definitions, attached to the end of this report.)

Sample Number	Aroclor Compound	Qualifier	Reason For Qualification	Review Section
H36L5, H36L9	All compounds	UJ	Excessive moisture content in sample	12

1. HOLDING TIMES AND PRESERVATION

All holding times criteria were met.

AROCLOR: Yes X No

All preservation criteria were met.

AROCLOR: Yes No X

Comments: The soil samples were extracted within 14 days from sample collection and all extracts were analyzed within 40 days from sample extraction.

According to the Chain-of-Custody record and case narrative, the two sample coolers were each received at a temperature of 7°C, which is outside the recommended temperature range of $4 \pm 2^\circ\text{C}$. When the sample preservation criteria are not met, but the sample analysis and extraction are within the technical holding times then professional judgment is used whether to qualify the data. No action was taken since the preservation exceedence was minimal and the extraction and holding times were well within the established parameters.

2. INITIAL INSTRUMENT CALIBRATIONS

The multi-component target compound analyses were performed according to method requirements:

AROCLOR: Yes X No

Comments: None.

Initial instrument calibrations were performed according to requirements and met the specified control limits listed in the functional guidelines.

AROCLOR: Yes X No

Comments: The Mean Retention Times (RTs) for each of the three to five major peaks and the RT of the surrogates have been determined. The RT Window has been calculated as ± 0.07 for each of the three to five Aroclor peaks and ± 0.05 and ± 0.10 for the surrogates tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), respectively.

At least one chromatogram from each of the Aroclor Standards yields peaks that give reflector deflections between 50-100% of full scale.

The concentrations of the five concentration level standards containing the Aroclors was prepared at the following concentrations 100, 200, 400, 800, and 1600 mg/mL and surrogates at 5.0, 10, 20, 40, and 80 ng/mL for TCX, and 10, 20, 40, 80, and 160 ng/mL for DCB.

The percent relative standard deviations (%RSDs) for the calibration peaks used to quantitate the Aroclors were within 20%. Summary forms and raw data were evaluated.

3. CONTINUING CALIBRATION VERIFICATION

Continuing instrument calibrations were performed according to requirements and met specified control limits listed in the functional guidelines.

AROCLOR: Yes X No

Comments: Continuing calibration standards were analyzed at the required frequency.

The %Ds were less than or equal to 15% for the opening Aroclor 1016/1260 standards. All %Ds for the closing Aroclor 1016/1260 standards were less than 50%.

No more than 14 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last mid-point concentration of the Aroclor Standards that ends an analytical sequence.

No more than 12 hours elapsed from the injection of the instrument blank that begins an analytical sequence and the injection of the last sample or blank that is part of an analytical sequence. Summary forms and raw data were evaluated.

4. BLANKS

The laboratory blank analysis was performed according to method requirements and met specified control limits.

AROCLOR: Yes X No

Comments: A Method blank was extracted along with the field samples at a rate of no more than 20 field samples per method blank and analyzed on the same GC/Electronic Capture Detector (GC/ECD) used for the field samples.

An acceptable instrument blank was run at the completion of the initial calibration sequence. Also an acceptable instrument blank was run at the beginning and ending of the analytical sequence for this sample delivery group.

A sulfur cleanup was not required; therefore a sulfur cleanup blank was not required for this sample delivery group.

5. SURROGATE SPIKES

Surrogate compound recovery analysis was performed according to method requirements and results met specified control limits.

AROCLOR: Yes X No

Comments: Two surrogate spikes, tetrachloro-m-xylene (TCX) and decachlorobiphenyl (DCB), were added to all samples, including Matrix Spike / Matrix Spike Duplicate (MS/MSDs), Laboratory Control Samples (LCSs), and blanks.

The surrogate percent recoveries (%Rs) were all within the QC limits (30-150%) for all samples. Summary forms and raw data were evaluated.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSDs)

Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses were performed according to method requirements and results met recommended recovery and precision limits.

AROCLOR: Yes X No

Comments: MS/MSD analyses were performed on sample H36L4. The percent recoveries and relative percent differences (RPDs) for the Aroclor MS/MSD analyses were within QC limits. Summary forms and raw data were evaluated.

7. LABORATORY CONTROL SAMPLE (LCS)

The laboratory control sample (LCS) was prepared and analyzed with every twenty or fewer samples of a similar matrix, or one per sample delivery group (whichever is more frequent). The percent recoveries for the LCS analyses were within QC limits. Summary forms and raw data were evaluated.

AROCLOR: Yes X No

Comments: None.

8. REGIONAL QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

Regional QA/QC was conducted as initiated by the EPA Region 8.

AROCLOR: Yes No X

Comments: The SDG shows no indication of EPA Region 8 initiating any additional QA / QC.

9. GEL PERMEATION CHROMATOGRAPHY (GPC) PERFORMANCE CHECK

The gel permeation chromatography (GPC) check was performed according to requirements and all spike compounds were within the specified quality control limits.

AROCLOR: Yes X No

Comments: The GPC calibration appears acceptable based upon review of the two.

10. TARGET COMPOUND IDENTIFICATION

The sample results were reviewed and all compound identifications were acceptable and met method requirements.

AROCLOR: Yes X No

Comments: No problems with the identification of the sample results were found. All retention times were met for the detected results.

None of the target analyses were identified in any of the samples. The sample extract was not diluted for any of the samples.

11. GAS CHROMATOGRAPH / MASS SPECTROMETER (GC/MS) CONFIRMATION

GC Confirmation of detected Aroclors has been confirmed

AROCLOR: Yes No X

Comments: No targeted Aroclors were detected in any of the field samples; therefore GC/MS confirmation is not required.

12. COMPOUND QUANTITATION AND REPORTED CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

The reported quantitative limits and CRQLs are accurate and unqualified

AROCLOR: Yes No X

Comments: Compound quantitations, as well as CRQLs were adjusted according to the equations provided in the method.

The percent moisture for sample H36L5 was determined to be 74%, which exceeds the 70.0% level, but is less than 90%. The results for this sample are therefore to be qualified as UJ for each of the target analytes.

The percent moisture for sample H36L9 was determined to be 78%, which exceeds the 70.0% level, but is less than 90%. The results for this sample are therefore to be qualified as UJ for each of the target analytes.

13. OTHER COMMENTS NOT ADDRESSED ELSEWHERE

- 1) Page 1 of the Evidence Audit Checklist (EAC) indicates three airbills are associated with this SDG, however documentation is only provided for Airbill Number 3430, which documents the shipment of four packages. The laboratory only documented receipt of two coolers, so it is unclear as to what the other two packages were that were included on the airbill.

ORGANIC DATA QUALITY ASSURANCE REVIEW**Region VIII****DATA QUALIFIER DEFINITIONS**

For the purpose of Data Validation, the following code letters and associated definitions are provided for use by the data validator to summarize the data quality.

GENERAL QUALIFIERS for use with both INORGANIC and ORGANIC DATA

- R - Reported value is "rejected." Resampling or reanalysis may be necessary to verify the presence or absence of the compound.
- J - The associated numerical value is an estimated quantity because the Quality Control criteria were not met.
- U J - The reported quantitation limit is estimated because Quality Control criteria were not met. Element or compound was not detected.
- N J - Estimated value of a tentatively identified compound. (Identified with a CAS number.) ORGANICS analysis only.
- 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.

000524

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L0

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767001
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A031,19101112B031
 % Moisture: 24. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) <u>ug/kg</u>	Q
12674-11-2	Aroclor-1016	44.	U
11104-28-2	Aroclor-1221	44.	U
11141-16-5	Aroclor-1232	44.	U
53469-21-9	Aroclor-1242	44.	U
12672-29-6	Aroclor-1248	44.	U
11097-69-1	Aroclor-1254	44.	U
11096-82-5	Aroclor-1260	44.	U
37324-23-5	Aroclor-1262	44.	U
11100-14-4	Aroclor-1268	44.	U

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000525

1H - FORM I ARO
AROCOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L1

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 10307.67002
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A032,19101112B032
 % Moisture: 25. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	44.	U
11104-28-2	Aroclor-1221	44.	U
11141-16-5	Aroclor-1232	44.	U
53469-21-9	Aroclor-1242	44.	U
12672-29-6	Aroclor-1248	44.	U
11097-69-1	Aroclor-1254	44.	U
11096-82-5	Aroclor-1260	44.	U
37324-23-5	Aroclor-1262	44.	U
11100-14-4	Aroclor-1268	44.	U

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000526

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L2

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767003
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A033,19101112B033
 % Moisture: 48. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.5 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	63.	U
11104-28-2	Aroclor-1221	63.	U
11141-16-5	Aroclor-1232	63.	U
53469-21-9	Aroclor-1242	63.	U
12672-29-6	Aroclor-1248	63.	U
11097-69-1	Aroclor-1254	63.	U
11096-82-5	Aroclor-1260	63.	U
37324-23-5	Aroclor-1262	63.	U
11100-14-4	Aroclor-1268	63.	U

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000527

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L3

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767004
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A034,19101112B034
 % Moisture: 20. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.8 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	41.	U
11104-28-2	Aroclor-1221	41.	U
11141-16-5	Aroclor-1232	41.	U
53469-21-9	Aroclor-1242	41.	U
12672-29-6	Aroclor-1248	41.	U
11097-69-1	Aroclor-1254	41.	U
11096-82-5	Aroclor-1260	41.	U
37324-23-5	Aroclor-1262	41.	U
11100-14-4	Aroclor-1268	41.	U

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 1/10/11

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

000528

EPA SAMPLE NO.

H36L4

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767005
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A035,19101112B035
 % Moisture: 38. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	53.	U
11104-28-2	Aroclor-1221	53.	U
11141-16-5	Aroclor-1232	53.	U
53469-21-9	Aroclor-1242	53.	U
12672-29-6	Aroclor-1248	53.	U
11097-69-1	Aroclor-1254	53.	U
11096-82-5	Aroclor-1260	53.	U
37324-23-5	Aroclor-1262	53.	U
11100-14-4	Aroclor-1268	53.	U

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000529

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L5

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767008
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A038,19101112B038
 % Moisture: 74. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:		Q
		(ug/L or ug/kg)	ug/kg	
12674-11-2	Aroclor-1016	120	U	UI
11104-28-2	Aroclor-1221	120	U	UI
11141-16-5	Aroclor-1232	120	U	UI
53469-21-9	Aroclor-1242	120	U	UI
12672-29-6	Aroclor-1248	120	U	UI
11097-69-1	Aroclor-1254	120	U	UI
11096-82-5	Aroclor-1260	120	U	UI
37324-23-5	Aroclor-1262	120	U	UI
11100-14-4	Aroclor-1268	120	U	UI

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 1/10/11

000530

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L6

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767009
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A039,19101112B039
 % Moisture: 49. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	65.	U
11104-28-2	Aroclor-1221	65.	U
11141-16-5	Aroclor-1232	65.	U
53469-21-9	Aroclor-1242	65.	U
12672-29-6	Aroclor-1248	65.	U
11097-69-1	Aroclor-1254	65.	U
11096-82-5	Aroclor-1260	65.	U
37324-23-5	Aroclor-1262	65.	U
11100-14-4	Aroclor-1268	65.	U

K3A
 1/10/11

000531

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L7

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767010
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A040,19101112B040
 % Moisture: 25. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.7 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	44.	U
11104-28-2	Aroclor-1221	44.	U
11141-16-5	Aroclor-1232	44.	U
53469-21-9	Aroclor-1242	44.	U
12672-29-6	Aroclor-1248	44.	U
11097-69-1	Aroclor-1254	44.	U
11096-82-5	Aroclor-1260	44.	U
37324-23-5	Aroclor-1262	44.	U
11100-14-4	Aroclor-1268	44.	U

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000532

1H - FORM I ARO
 AROCLOR ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

H36L9

Lab Name: ALS Laboratory Group Contract: EPW05026
 Lab Code: DATA C Case No.: 40755 Mod. Ref No.: _____ SDG No.: H36L0
 Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: 1030767011
 Sample wt/vol: 30.0 (g/mL) g Lab File ID: 19101112A041,19101112B041
 % Moisture: 78. Decanted: (Y/N) N Date Received: 11/03/2010
 Extraction: (Type) SONC Date Extracted: 11/04/2010
 Concentrated Extract Volume: 5000 (uL) Date Analyzed: 11/12/2010
 Injection Volume: 2.0 (uL) GPC Factor: 2.0 Dilution Factor: 1.0
 GPC Cleanup: (Y/N) Y pH: 6.6 Sulfur Cleanup: (Y/N) Y
 Acid Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/kg)	ug/kg
12674-11-2	Aroclor-1016	150	U
11104-28-2	Aroclor-1221	150	U
11141-16-5	Aroclor-1232	150	U
53469-21-9	Aroclor-1242	150	U
12672-29-6	Aroclor-1248	150	U
11097-69-1	Aroclor-1254	150	U
11096-82-5	Aroclor-1260	150	U
37324-23-5	Aroclor-1262	150	U
11100-14-4	Aroclor-1268	150	U

KSA
 1/10/11

000533

APPENDIX C

Project Field Logbook

"Outdoor writing products...
...for outdoor writing people."

000534



RECYCLABLE

"Rite in the Rain" - A unique All-Weather Writing paper created to shed water and enhance the written message. It is widely used throughout the world for recording critical field data in all kinds of weather.

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6 32281 39111 1



"Rite in the Rain"

ALL-WEATHER
JOURNAL

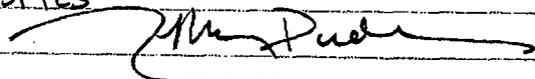
No. 391

Upper Animas
Mining District
TDD No 1008-13

²
Dudevoir 9/1/10

M. Dudevoir spoke w/ Sabrina
Forrest (EPA SAM)

- would like 2 START
personnel to accompany
Bill Schroder on sampling
event for recon in
Cement Creek / Animas River
- START people A. Longworth
J. Gilbert or J. Christner
- other sites to check out
 - Mayflower tailings piles:
leaking red into Animas -
staining on banks
 - Kendrick Gelder smelter
 - Kitty Mack waste piles
- START can sign on EPA
HASP for sampling/recon
event - will make own
HASP for actual sampling
- goal is not to do a
watershed listing => focus
on listing individual mine
sites



9/1/10

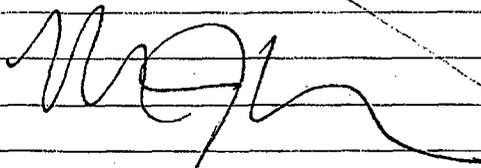
M. Dudevoir 9/13/10³

M. Dudevoir + A. Longworth
mob to Silverton

9/14/10
M. Dudevoir + A. Longworth
accompany B. Schroder
on EPA water sampling
event -> activities logged
in EPA logbook

9/15/10
Same activities as previous
day. Completed sampling.

9/15/10



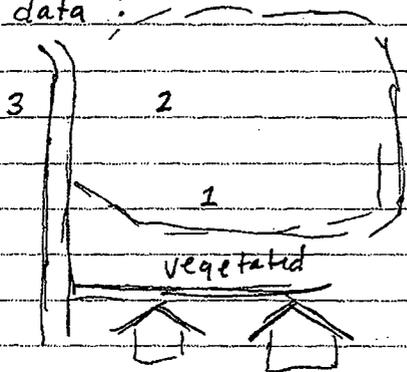
Dudewain

9/16/10

09:00 Met w/ Lisa Richardson (BLM)
to see Kendrick Gelder Smelter
Waste, Kitty Mack + Mayflower
Sunnyside tailings

Kendrick-Gelder is on N side
of town. Large smelter waste
pile (photos 100-0001 through
100-0007)

used BLM XRF to collect in site
data:



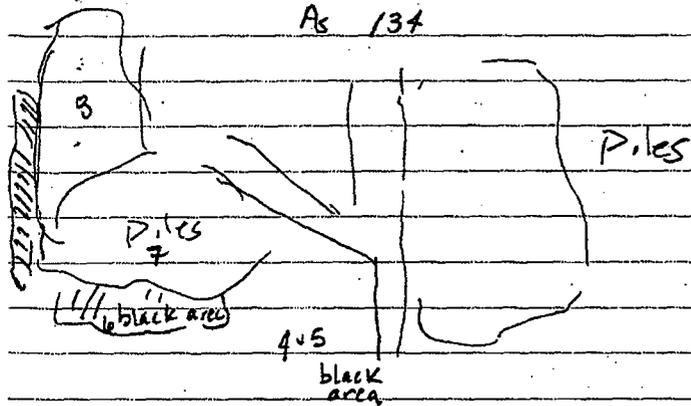
Smelter EPA.1	Pb 112	Co 158
	As 21	Fe
	Zn 83	Mn 770
	Cu 114	

Smelter EPA.2	Pb 97	Cu 96
	As ND	Co -
	Zn 70	Mn -

Dudewain

9/16/10

Smelter EPA.3 Pb 2279
As 134



Smelter EPA.4 Pb 1327 Cu 1928
As 112 Co 1408
Zn 12.1K

Smelter EPA.5 Pb 1092 Cu 2330
As 127 Co 1203
Zn 10K

Smelter EPA.6 Pb 1144 Cu 1964
As - Co 1094
Zn 11.5K Mn 2804

Smelter EPA.7 Pb 97 Cu 142
As 17 Co 392
Zn 114 Mn

Smelter EPA.8 Pb 56
As 12
Zn 89

6

Dudevoir

9/16/10

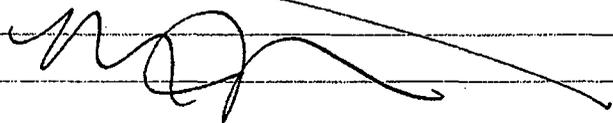
construction project is ongoing at smelter site. Unclear where smelter waste piles are/were. Observed black spots in low areas w/ high readings for Zn + what appeared to be similar material + smelter waste mingled w/ fill piles.

Foreman said they put 2" of onsite fill + 4" topsoil over site → residential development

+ Marcy Bidwell - local
+ Terry - foreman

post entry 9/20/10 - After site visit determined we were at the wrong location + the above described site is the Rose-Walsh smelter

9/20/10



Dudevoir

9/16/10⁷

Sunnyside - Impoundment constructed by Sunnyside - Larry Peria (foreman) 1992 - 1998-ish construction. Maybe constructed from wet material from mothy material from Aladstone waste ponds. (photos 100-0008 - 100-0012)

Water is seeping from piles under the road and it's entering river. Extensive brown staining

pH = 5.83

Cond = 436 µS/cm

Temp = 9.2

Observed some red/brown sediment

+ slower water

pH 5.2

Cond 1472 µS/cm

temp 11.3°C

water in sediment

pH 4.63

Cond 1700 µS/cm

temp 16.5

000537

Dudewoir

9/16/10

water in Animas on opposite side
of bank

pH: 6.9

cond: 295 μ S/cm

temp: 7.2°C

Judy Zimmerman

County Assessor has Sunnyside
maps + aerial photos.

Tailings piles are pretty flat on
top. All have drainage ditches
behind them. Evidence of standing
water on top of piles

Bill Simon - head of Animas
stakeholders has done work
here.

Below mayflower Mill - dead area
some red fines, lots of dead
aspen trees. → off County Road 2

XRF of red fine material by
the road Pb 1239 Zn 298

As 76 Cu 171

Dudewoir

9/16/10

Kitty Mack:

owner Jack Clark (part) owns
+ has not historically been
friendly w/ EPA or BLM other
owner Joe + Cheryl Jepsen (?)

★ 387-5400 - home phone ★

Large area of white waste w/
evidence of ATV/dirt biking on
the piles. Few inches under the
white sand is red/brown fine
material.

Homeowner (Cheryl J.) agreed
to XRF in situ shots. Seemed
agreeable to sampling + mentioned
they would like to see material
cleaned up

XRF in red material (-1" deep)

Pb 5111 Zn 231

As 152 Cu 617

XRF in white material (surface)

Pb 8403 Zn 869

As 1003 Cu 2368

wet area by old RR grade that
drains eventually to Animas.

Dudevoir

9/16/10

XRF in drainage area

Pb ~~ND~~ 361 Zn 1153 Ni 70

As 1153 Cu 1279 Co 140

XRF by RR grade

Pb 27.7K Zn 18.6K Mn 36K

As Cu 2763

property has beaver pond. Obs.
fish in pond

XRF by pond

Pb 7226 Zn 1707 Mn 2552

As 81 Cu 1606

homeowner said in summer
people fish in the area. Homeowner
is on well water ~80' w/ no
treatment

XRF in open area on W side (white color)

Pb 14.2K Zn 24.7K Mn 75.6K

As 243 Cu 2859

XRF same spot - dark grey color

Pb 11.8K Zn 10.6K Mn 42.7K

As - Cu 1131 Fe 15K

XRF adjacent to Animas

Pb 2883 Zn 914 Mn 21.7K

As - Cu 341

Photo 100-0028 back to Animas
facing property

Dudevoir

9/16/10

XRF in Animas fines

Pb 235 Zn 702 Mn 2802

As 54 Cu 90

XRF in red sediment on Animas banks

Pb 3021 Zn 2544 Mn 5102

As - Cu 127

Same location - more grey color

Pb 3676 Zn 2562 Mn 19.1K

As 141 Cu 325

Pile of waste rock adjacent to
road + cement creek - observed
staining on wall and erosion on
pile (photo 100-0031). Collected
GPS.

Waste rock in wooden ^{cribbing} containment -
on cement creek + road. Flow
coming down the side. Opposite
side of road → stained wetland
area

adjacent to cribbing

temp - 15.80

pH - 6.77

cond - 1292

Dudevoir

MD
9/10/10

- Meeting w/ S. Forrest / A. Longworth
- Sampling to be pushed back because Sabrina will meet w/ stakeholders 10/18 + wants their buy in to FSP
 - week of 1 NOV Sabrina will be there w/ Bill Schroder
 - Kitty Mack - pull out as separate PA/SI
 - Kendrick Gelder will be pulled out as separate PA/SI probably - may be owned by town. Sabrina will check on ownership / access
 - Discussed listing will have to be based on wetlands unless we can prove animas below C.C. is 3x above conc above C.C.
 - GW wells are available - can't list based on GW bc no background sample available
 - fishing observed blt Arastra Gulch + Cunningham → upstream of C.C. in animas

13

Dudevoir

9/10/10

- Anglo Saxon Mine - 319 reclamation by private owner (maybe?)
- also should investigate area around Co goldfields building → kill zone around quonset hut possibility that some tailings were not removed
- watch out for area between Red + Bonita + Cement Creek ⇒ MSI has vegetation plots
- START will talk w/ Bryan Williams about sample plan → Sabrina would like to list ^{score} on fisheries too, not just wetlands.
- we think that means bracketing each gulch going upstream
- START will get prelim. plan together + call Sabrina on 9/7/10

000540

Dudevoir

10/7/10

START determined listing on fisheries will require approx 2 x # of samples → bracketing gulches on lower Cement Creek. Only can list fisheries based on 3x background score in Animas. Proposed to Sabrina → do ER SAP to determine if fisheries sampling is required (do 3 samps on 10/8/10 - 10/9/10) Sabrina approved "ER" sampling to avoid unnecessary Cement Creek sampling if possible. Will send samps to ESAT + get ER SAP to Sabrina

10/7/10

Longworth

Friday, 10/8/10

0630 A Longworth departs Denver for Silverton.

1300 A Longworth arrives in Silverton and tries to find appropriate locations for sampling upper Animas and Cement Creek. Cement Creek appears to be entering the Animas and running along the bank, sample of the Animas will be taken from the center of the channel just before it begins to braid.

1450 Collect sample UASW001-08102010 and UASW001D-08102010.

Multimeter #3 used, calibrated for pH (3 point) and conductivity.

Temp = 10.2°C

pH = 4.96

Cond = 617 µS/cm

Water samples filtered using 0.45 micron Gertech filter. UASW001-08102010

1x 1 L poly container, UASW001D-08102010

3x 1 L poly containers 1 for sample 2 for MS/MSD analysis. Samples preserved with HGT before cooling to 4°C

Longworth

10/08/10

08/10/10

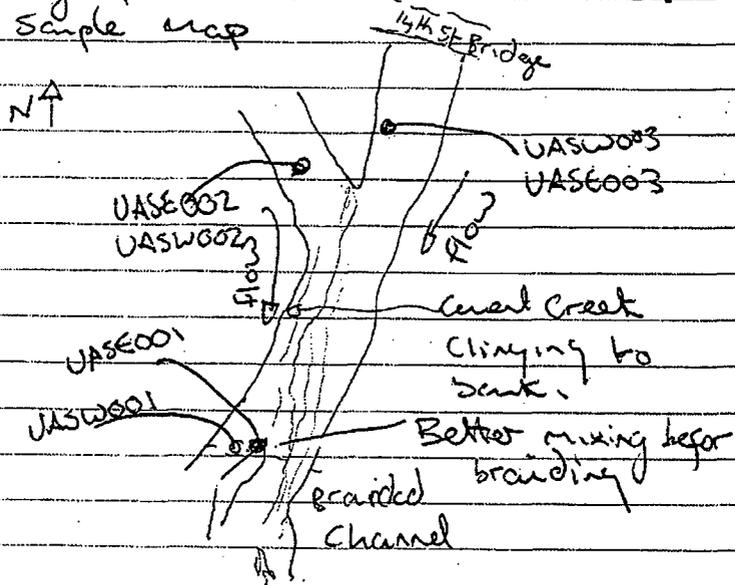
1435 Collect samples UASE001-0810210

and UASE001D-08102010 from
north side of island, below tree
and between rocks. UASE001-08102010

= 1 x 250ml poly UASE001D-0810210
= 3 x 250ml poly (1=sample, 2=K_{sp}/K_D)

GPS of both locations taken, photo-
graphs also taken. GPS=#3.

Sample map



1530 UASW002-0810210 taken

from Crest Creek before
confluence with the upper
Animas. Sample collected

Longworth

10/08/10

as before.

Temp = 12°C

pH = 3.2

Cond = 1010 $\mu\text{S}/\text{cm}$

1 x 1L poly preserved with H

1535 Collect sample UASW002-08102010

from Crest Creek, co located with
UASE002-08102010. 1 x 250ml.

poly container collected with
disposable scoop.

1600 Collect sample UASW003-08102000

from Upper Animas downstream
of USGS station at 14th Street.

Temp = 10.5°C

pH = 7.91

Cond = 295 $\mu\text{S}/\text{cm}$

1605 Collect sample UASE003-08102010

1 x 250ml poly.

GPS and photos taken at all
locations

1630 end of day on site.

10/25/10

27:30 Left DC for Silverton

04:00 Arrived in Silverton -

spoke w/ Bill Simon
arranged to use
miners hospital for
sample management

17:00 Calibrated pH meter

17:05 Collected UASE029 +
UASW029

pH: 7.25

temp: 5.4°C

cond: 634 μ S

photo - 100-1680

17:30 Collected UASW033 +
UASE033 (Mineral
Creek)

pH: 7.51

temp: 10°C

cond: 390 μ S

photo: 100-1682-1681

16:00 packed samples in cooler
+ secured in hotel roomPut GPS, pump batteries on
charge

10/25/10

MD

10/26/10

M. Dudley

08:00 Attempted to locate spot for

sampling on Mineral Creek

below water treatment plant

could not get above Animas +

below outfall \rightarrow keep original

033 as sample

08:30 collected UASW032 and

UASE032

(Animas
downstream
of Mineral
Creek)temp - less than ϕ

pH 6.85 photo 100-1682

cond 522 μ S

08:50 collected UASW034 / UASE034

at Animas upstream of Mineral
Creektemp: less than ϕ

pH: 6.65

cond: 0.59 mS

photo 100-1683

09:37 Collected UASW035 and

UASE035 \rightarrow Animas

downstream of Cement Creek

temp: below ϕ °C

pH: 3.88

cond: 1139 μ S

photo: 100-1684

10/21/10

M. Dudewicz

09:25 Collected UASW005 + UASE005
collected duplicate UASW098 +
UASE098, and MS/MSD at
this location
temp 0.7°C cond 913 μ S
pH 6.93 photo 100-1706

10:00 Collected UASE007 + UASW007
in American Tunnel discharge
directly upstream of Cement Creek
temp 6.1 cond 2.38 mS
pH 5.73 photo 100-1707

10:05 Collected UASW001 at
American Tunnel portal
temp 7.1 cond 2.40 mS
pH 4.48 photo 100-1708
collected sed and isotope samples

10:15 Collected UASW008 + UASE008
at Cement Creek upstream
of American Tunnel
temp below 0°C cond 1505 μ S
pH 4.30 photo 100-1709

10/27/10

M. Dudewicz

10:45 Collected UASW009 + UASE009
on Cement Creek downstream
of N. Fork C.C.
temp 0.5 cond 14.91
pH 4.32 photo 100-1710

10:55 Collected UASW013 + UASE013
on Cement Creek upstream
of N. Fork C.C.
temp 0.0°C cond 1269
pH 5.76 photo 100-1711

11:10 Collected UASW010 + UASE010
on N. Fork of CC
temp 0.1°C cond 2.29 mS
pH 3.42 photo 100-1712 + 1713

13:00 Attempted to sample
locations near Red + Bonita +
Gold King 7 Level. Vehicles
could not make it. Returned
to office at Miners Hospital
to pack + label samples. Discussed
concern about collecting
sediment above N Fork due
to frozen conditions

10/28/10

M. Dudoir

08:30 Called Sabrina Forrest about sediment concern → not able to see creek enough to pick good sediment locations due to ice / snow. We will collect as much as we can but may not make it above R+B or Mogul. Today will hike to Gold King + Red + Bonita + get seds, water, soils. Will call SF tomorrow w/ progress report + plan

09:45 @ UASW014 and UASE014

below Rd and Bonita on Cement Crk.

temp 0.3°C pH 5.97

cond 1352 μS photo 100-1714

10:00 Collected UASW015 + UASE015

in channel below Red + Bonita

temp 2.0°C

pH 6.94

cond 2.16 mS

photo 100-1715

10:30 Collected AD003 at

Red + Bonita

temp 5.5°C

pH 6.32

cond 2.20 mS

photo 100-1716

M. Dudoir

11:00 Collected UASW016 + UASE016 in Cement Creek upstream of Red + Bonita

temp UR cond 398 μS

pH 5.35 photo 100-1717

sediment limited at this location

11:30 Recollected sediment at N

Photo 100-1718 Fork of Cement Creek to get more fines → UASE060

11:38 Recalibrated pH meter

due to higher than expected readings for pH at Red + Bonita. Meter appeared to be reading in normal range. R+B runoff may be diluted by runoff

Collected UAAAD002 AT

13:40 Gold King 7 Level adit

temp 7.3°C cond 1306 μS

pH 4.31 photo 100-1719

14:10 Collected UASW011 + UASE011

at road crossing below 7

Level → could not get below

lower piles due to steep

slope + snow

10/28/10

M. Dunder

temp 7.7°C

cond 1724 μ S

pH 3.93

photo 100-1721

14:25 Collected UASW012 + UAS5012

above Gold King \rightarrow attempt
was made to get higher
but creek was frozen over
& no flow obs.

temp 1.8°C

cond 374 μ S

pH 4.26

photo 100-1722

not enough sediment to
collect PCB jar at this location

10:30 Returned to office at
Miners hotel to manage
samples. Plan for tomorrow

+ Saturday:

- hike to ^{Grand Mogul} Mogul \rightarrow samples,
isotope samples, transducer
maint.
- hike to 7 Level \rightarrow isotope
samples, transducer,
modify transducer but
- Red + Bonita \rightarrow isotope
transducer, waste rock
- American tunnel \rightarrow
transducer / waste rock

10/28/10

M. Dunder

BW will return to
Denver + drop samples off
at ESAT - NW, MD + Al will
stay in Silverton to
complete remaining tasks

10/28/10

M. Dunder

10/29/10

M. Dudewar

0800 Calibrated pH meter

Called SF → updated on 10/28

Progress + will sample Mogul/
Grand Mogul todayH+S Melting: Slips/Trips in
snow. Watch snow conditions
for slides. Hydrate. Stay warm11:55 Collected UASW017 + UASE017
below Mogul wetlandtemp 3.1°C cond 478 μS
pH 5.12 photo 100-172312:50 Collected UASW019 + UASE019
at Mogul wetlandtemp 4.1 cond 1225
pH 3.32 photo 100-1724collected duplicate UASE099 +
UASW099 at this location
with MS/MSD13:30 Collected UASW018 + UASE018
upstream of Mogul wetlandtemp 3.4 cond 485 μS
pH 4.23 photo 100-1725there is approx 1' snow + 1726
on the ground + weather
is sunny in the 40s (°F)

⇒ Snowmelt in creek flow

10/29/10

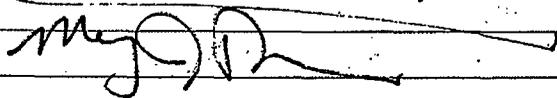
M. Dudewar

13:50 Collected UASW020 + UASE020

- upstream of Mogul Mine on
Cement CreekpH 5.69 cond 284 μS
temp 1.0 photo 100-1727Also collected isotope sample
at this location→ 2 1L poly w/no headspace
2 40oz vOA 3/4 fullCollected AD004 at Mogul
Mine Adit (CO2D)temp 5.1 cond 717 μS
pH 3.98 photo 100-1728

Following sample collection
batteries died in pH meter.
Returned to town - could not
find batteries in town + had
to drive to Durango to get
some ⇒ no more sampling
for the day

10/29/10



10/30/10

M. Dadevoir

08:00 H.S. Mushing - Skips, trips, falls
careful driving on snowy roads,
hydrate, stay warm

09:15 collected isotope sample
at AD001 → American Tunnel

09:30 Shot VRF around portal
observed. Pb ~ 200-600 ppm

Cobalt ~ 400 ppm

Parameters @ American Tunnel

temp: 7.5 °C

cond - 2.10 mS

pH 5.26

10:00 Collected SD001 at American
Tunnel - ground is very
frozen - sample 0-0.5"

10:05 Collected SD002 at American
Tunnel 0-1"

• photo 100-1729

On drive to Red + Bonita got
a flat tire - drove down
mountain to repair. Had to
go to Durango for a new
tire.

10/30/10

MSR

10/31/10

M. Dadevoir

08:30 at Red + Bonita
downloaded transducer + put
on new desiccant.

09:15 Collected isotope sample at
adit

temp 5.7 °C

09:15 Collected SD03 0-8" top photo 100-1731
• photo 100-1725-31 cond 28.3 uS

09:30 Collected SD04 at 0-6" of
middle level of pile; photo 100-1732

09:40 Collected SD05 at bottom level
of pile @ 0-6" photo 100-1733

11:10 Collected UASED1 + UASW01
downstream of Mogul North
Mine

temp 2.0 °C

photo 100-1736

pH 5.94

cond 337 uS (micro)

11:20 Collected UASE022 + UASW022 in
Mogul North drainage

temp 3.7 °C

pH 4.96

photo 100-1737

cond 388 uS

11:40 Collected UAS0006 at Mogul
North waste pile @ 0.6"

1 sample required because pile is small
photo: 100-1738, 1739, 1740, 1741

10/26/10 M. Dudgeon

09:45 Collected UASW002 +
UASE002at Cement Creek upstream of
Animastemp: below θ

pH: 3.60

cond: 970 μ S

• photo 100-1685

10:15 Collected UASW003 + UASE003
on Animas River upstream of
Cement Creektemp: below θ

pH: 7.61

cond: 366 μ S

• photo: 100-1686

10:35 Collected UASW035 + UASE035
downstream of Kendrick Smeltertemp: below θ ⁽¹⁰⁾ 1.1°C

pH: 3.83

cond: 1106 μ S

• photo: 100-1687

collected duplicate + MS/MSD at
this location

Dup is UASW047 - UASE047

10/26/10 M. Dudgeon

11:15 Collected UASW036 + UASE036
on Cement Creek above
Kendrick Smelter

temp 1.8°C

pH 4.16

cond 1162 μ S

• photo 100-1688

11:50 Collected UASW037 + UASE037 on
Cement Creek below Illinois Gulch

temp 3.6°C

cond 1109

pH 4.20

• photo 100-1689

Did not collect UASE038/UASW038
because confluence of
Illinois Gulch + Cement Creek
appeared to be on private
property w/ a no trespassing
sign12:15 Collected UASW039 +
UASE039 \rightarrow upstream of
Illinois Gulch / downstream of
Ohio Gulchtemp 3.0°C
pH 3.80cond 1155 μ S
photo 100-1690

10/26/10

M. Dudevoin

12:20 Collected UASW040 + UASE040^{E040}

discharge of Ohio Gulch

temp: less than 0°C

pH: 2.94

cond: 1139

• photo: 100-1691

12:30 Collected UASW041 + UASE041

on Cement Creek upstream of
Ohio Gulch outfall

temp: 3.6

cond: 1170

pH: 3.70

• photo: 100-1692

13:00 - 13:50 lunch break

13:50 Collected UASW042 + UASE042

downstream of Anglo Saxon
Mine on Cement

temp: 5.6

pH: 3.86

cond: 1161

• photo: 100-1693

14:00 Collected UASW044 + UASE044

upstream of Anglo Saxon
Mine of Cement Creek

temp: 5.6°C

cond: 1145 S

pH: 4.00

• photo: 100-1694

↙ also downstream
of Minnesota
Gulch

10/26/10

M. Dudevoin

14:15 Collected UASW043 + UASE043

at Anglo Saxon discharge - adjacent
to cribbings

temp: 9.0°C

cond: 1554

pH: 6.95

• photo: 100-1695

14:30 Collected UASW045 + UASE045 in

Minnesota Gulch - upstream of
culvert under road

temp: 1.2°C

cond: 503 S

pH: 4.41

• photo: 100-1696

14:40 Collected UASW046 + UASE046

Cement Creek upstream of
Minnesota Gulch

temp: 5.7°C

cond: 1158

pH: 3.82

• photo: 100-1697

Did not collect UASW048/UASE048

→ could not identify flow from
EIK tunnel.

15:05 Collected UASW047 + UASE047

downstream of EIK Tunnel +
Fairview Gulch on Cement Creek

temp: 5.1°C

pH: 3.80

cond: 1152

• photo: 100-1698

8/10/26/10

M. Dudewicz

Avalanche Mine Gulch → not flowing.

15:20 Collected UASW049 + UASE049
downstream of Georgia
Gulch, relocated closer to
Georgia Gulch

temp: 5.0 °C cond: 1139
pH: 4.05 photo: 100-1699

15:40 Collected UASW050 + UASE050
upstream of Georgia Gulch
on Cement Creek

temp: 4.7 °C cond: 1144
pH: 4.17 photo: 100-1700

16:40 Collected UASW053⁴ + UASE053⁴
~~downstream of~~ Prospect Gulch
upstream of ^{SA} Cement Creek in Prospect Gulch
discharge

temp: 1.5 °C cond: 637
pH: 4.12 photo: 100-1701

UASW053, UASW055, UASE053 +
UASE055 are all on

private property → no
access, so did not sample

17:00 conducted Recon on sites for
tomorrow

18:00 left site for the day

10/27/10

M. Anderson

08:30 Collected UASW056 + UASE056
on Cement Creek downstream
of dry Gulch

temp 0.2 °C cond: 1186
pH 4.29 photo: 100-1702

Did not collect UASW057 +
UASE057 because Dry
Gulch was dry

08:45 Collected UASW058 + UASE058
on Cement Creek upstream of
dry Gulch

temp 0.1 °C cond: 1215
pH 4.40 photo: 100-1703

09:00 Collected UASE004 + UASW004
on Cement Creek downstream
of confluence w S. Fork C.C.

temp 0.00 cond: 1259
pH 4.81 photo: 100-1704

09:15 Collected UASE006 + UASW006 →
Cement Creek upstream of
S. Fork C.C.

temp ^(M) pH: below 0 °C cond: 1619
pH ^(M) temp: 3.93 photo: 100-1705

10/31/10

M. Dudevair

11:50 Collected UASE023 + UASW023
downstream of Queen Anne
drainage on Cement Creek

temp 3.8°C

pH 5.71

photo 100-1742

cond 341 μ S

12:05 Collected UASE024 + UASW024

in Queen Anne drainage

temp 3.2

pH 5.40

photo 100-1743

Cond 412 μ S

12:20 Collected UASO007 at Grand

Mogul Slope west side

0-6" photo 100-1744

12:25 Collected UASO008 at Grand

Mogul Slope E side

0-6" photo 100-1745

12:40 Collected UASW051 + UASE051

very little sediment - sed we
could collect is clinging to
mass. Not enough seeds for

PCBs. Location is at toe
of Grand Mogul

temp 1.5°C

cond 780 μ S

pH 3.14

photo 100-1746

10/31/10

M. Dudevair

Also collected isotope sample
at this location

13:00 Collected UASW030 + UASE030

on Cement Creek upstream of

Grand Mogul - also collected

isotopes

temp 0.7°C

cond 274 μ S

pH 6.73

photo 100-1749

* photo 1747 + 1748 \rightarrow hike up to

sample location

* photo 1750 \rightarrow Grand Mogul +

Mogul slope piles

very limited seeds at SE030 - not
enough for PCB

13:15 Collected UASO009 on E side

of Grand Mogul Piles

0-6" photo 100-1757

13:20 Collected UASE010⁽¹⁰⁾ UASO010

on Grand Mogul piles - middle

0-6" photo 100-1758

13:25 Collected UASO011 on ^{Grand} Mogul

piles W side 0-6" photo 100-1759

14:00 Collected UASO012 on ⁽¹⁰⁾ Grand

Mogul Mine piles W side, 0-6"

photo 100-1760

10/31/10

M. Dudevar

14:05 Collected UASO013 on Mogul
Mine Piles → adjacent to shed
0-6" photo 100-1761

14:30 Collected UASO014 on Mogul
Piles E side 0-6" photo 1762 +
100-1763

15:00 Tried to collect UASWDS1 +
UASEOS1 → Mammoth Tunnel,*
Observed 2 ponds (treatment
cells). Could not locate an
outfall from the lower cell.

Cement Creek adjacent to
the tunnel appeared red
colored + observed black moss
+ slime. Pond appears to be
infiltrating. Did not collect
sample because no sample
point could be identified.

Photos: 100-1764 + 100-1765

16:00 Could not reach sample locations
above Grand Mogul Mine due
to snow + potentially unsafe
conditions ⇒ 025, 026, 027, 028, 031
- did not collect 029 → no discharge
from G. Mogul Mine

* Determined UASWDS2 + UASEOS2 are not
necessary w/ no flow from Mammoth Tunnel

11/1/10

M. Dudevar

09:45 Collected UASW012 isotope
sample → upstream Gold King
temp 0.6
pH 4.76
cond 353 uS

10:05 Collected UAAD002 isotope
sample → Gold King adit
temp: 7.9°C
pH: 4.26
cond: 1619

Could not collect waste rock/
soil sample at Gold King. EPA
access agreement does not
include soils. The only public
area of waste pile is too
steep + loose to sample
photo 100-1766 + 100-1767

12:00 Hiked to vehicle, returned
to miners Hospital to pack
supplies. Added ice to coolers
+ custody sealed for return
trip to denver

14:00 Departed from Silverton

11/1/10

M.D.

NO ENTRIES TO
FOLLOW

1/1/10

Mojave

• 000555

APPENDIX D

Project Data Quality Objectives