Chino Mines Company
Hurley, New Mexico

Technical Memorandum
Surface Water Sampling & Analysis of Rainfall Pools

Addendum to
Administrative Order on Consent
Revised Remedial Investigation Report
for the Smelter/Tailing Soils Investigation Unit

Freeport McMoRan
Chino Mines Company
210 Cortez Avenue
Hurley, New Mexico 88043

Prepared by ARCADIS-US, Inc.
and SRK Consulting (U.S.)

September 25, 2008

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EXECUTIVE SUMMARY

Introduction

This Smelter/Tailing Soil Investigation Unit (STSIU) Surface Water Sampling and Analysis of Rainfall Pools Technical Memorandum (Technical Memorandum) has been prepared on behalf of Freeport McMoRan Chino Mines Company (Chino) in Hurley, New Mexico. As part of the STSIU Remedial Investigation (RI) conducted by SRK, surface water was initially sampled in November of 2004, with additional sampling conducted in July of 2006 (SRK, 2008). Analytical results from these sampling events indicated that concentrations of dissolved copper (Cu) exceeded hardness-adjusted aquatic life criteria at most sampling locations. Exceedances of aquatic life criteria for aluminum, cadmium, and lead were also noted for select locations.

The objectives of the September 2007 investigation were to:

- Determine if the use of a standard 0.45 micron pore size filter in the previous two sampling rounds may have overestimated the concentrations of trace metals that are truly dissolved and, therefore, biologically available;
- Further evaluate the fate, transport, and potential toxicity of copper and other trace metals in rainfall pools; and
- Summarize the results of the investigation in a Technical Memorandum.

The scope of work for this investigation focused on two tasks:

- Conducting ultra-filtration of rainfall pool samples to further characterize concentrations of dissolved copper and other trace metals in surface water for comparison to hardness-adjusted aquatic life criteria.
- Developing a conceptual site model to describe sources, fate, transport, and potential toxicity of copper and other trace metals in rainfall pools.

The Chino porphyry copper ore contains copper, molybdenum, antimony, cadmium, chromium, lead, and zinc at concentrations above reference soil sample concentrations. Antimony, arsenic, barium, cadmium, chromium, copper, lead, molybdenum, selenium, and silver were measured in historic smelter emissions when the smelter was operating (previous to 2001) (Chino, 1995).

Analytical Results

The following bullets summarize analytical results for STSIU surface water samples collected in September 2007:

- Surface water sampling location SW05 is located on Rustler Creek down gradient from the Highway to Heaven haul road that was built across the head of the Rustler Canyon drainage in the mid-1990's using waste rock. Concentrations of aluminum and copper in surface water exceeded chronic ambient aquatic life criteria. Remedial activities are currently underway for the Highway to Heaven haul road to address this source area.

- Aluminum was primarily present in the filterable (greater than 0.45-micron) size fraction. Aluminum is not a major constituent of Chino ore and was not listed as being associated with historic smelter stack emissions (Chino, 1995).

- Cadmium was generally excluded from the filtered (0.45 micron and ultra-filtered) size fractions. The CDW-1 sample cadmium concentration minimally exceeded the hardness-adjusted chronic criterion for one sample.

- Copper concentrations generally decreased with decreasing filtered size fraction. However, ultra-filtered copper concentrations exceeded the respective hardness-adjusted acute criteria at seven and the chronic criteria at eight surface water sampling locations. Chronic criteria ratios (measured concentration divided by hardness-adjusted criterion) were less than 4.0 for all but two of the sampling locations, CDW-1 and SW-05.

- Lead is a minor constituent in Chino ore, which was detected in historic smelter emissions. Concentrations of dissolved lead in all surface water samples were below acute and chronic hardness-adjusted aquatic water quality criteria.

- Overall, aluminum, cadmium, copper, and lead present a low risk to aquatic life in STSIU surface water.

Conceptual Site Model

Constituents in surface water are derived primarily from interaction of precipitation water with and runoff from soil surfaces. The STSIU drainages are ephemeral with minimal base flow (i.e., groundwater discharging to surface water). The conceptual site model used the mineral composition of STSIU soil to discern probable sources of constituents in surface water. Based upon the three rounds of soil sampling performed to support the STSIU RI, copper, arsenic, cadmium, cobalt, lead, molybdenum, selenium, and silver provide a potential "fingerprint" for identifying impacts to soil from historic smelter emissions.

Near Smelter

Metals concentrations and correlations in near smelter soil and surface water reflect contributions from historic smelter emissions, consistent with STSIU RI findings (SRK, 2008). Total and dissolved concentrations of cadmium and copper were generally higher in samples collected from near smelter sampling locations compared with other STSIU surface water sampling locations. Total and dissolved concentrations of metals were similar for

manganese, aluminum (CDW-1), cadmium, and copper, indicating that these constituents are not associated with the particulate phase. Ultra-filtration of near smelter surface water concentrations resulted in decreases in dissolved constituent concentrations below chronic criteria for all but cadmium at CDW-1, and copper at CDW-1 and SW04. The ultra-filtered cadmium concentration for sample CDW-1 was 0.0009 mg/L and minimally exceeded the chronic criterion of 0.00087 mg/L. The CDW-1 surface water sample had a chronic criterion ratio (measured concentration divided by chronic criterion) value of 41. The chronic criterion ratio values for copper in the SW04 surface water sample was 2.8, indicating a low risk. The generally low hardness, low turbidity, low alkalinity, and low DOC for the CDW-1 surface water sample indicated limited binding capacity for copper in water at this sampling location.

Stock Tanks

Metals concentrations in stock tank soil and surface water reflect some contributions from historic smelter emissions. For stock tank soil samples, copper was correlated with aluminum, arsenic, cadmium, chromium, cobalt, iron, lead, and zinc. Of these correlated constituents, only copper concentrations were elevated in stock tank soil samples with respect to reference soil samples (ERA16 through ERA21). For the stock tank surface water samples, total aluminum, copper, iron, lead, cadmium, and turbidity were correlated. Given the high turbidity of surface water in stock tanks, these constituents are likely related due to their presence in particulate matter. These metals were readily filtered from water samples. Copper chronic criteria ratios for ultra-filtered samples were less than 4.0. Copper that passes through the ultra-filtration membrane may be bound with low molecular weight aromatic organic carbon and may not be bioavailable. In general, copper and other metals in stock tank surface water pose a low risk.

Upland Drainages

Concentrations and correlations of metals in upland drainage soil and surface water samples reflect lesser contributions from historic smelter emissions. Consistent with declining concentrations of historic smelter emission-related constituents with distance from the former smelter, only copper was transported from historic smelter emissions in sufficient quantities to be statistically significant in upland drainage soil. Based on concentrations of metals in ultra-filtration samples, limited exceedances of chronic criteria were noted for upland drainage surface water samples (aluminum at SW05, and copper at SW05 and SW06A). With the exception of upland drainage surface water sampling location SW05 which is impacted by the Highway to Heaven haul road, concentrations of metals in upland drainage surface water samples reflect lesser impacts from historic smelter emissions compared with other portions of the STSIU and pose a low risk.

Summary and Conclusions

The distributions of metals in STSIU soil samples indicated that most sampling locations had at least some contributions from historic smelter emissions. Of the sample groups evaluated in this Technical Memorandum, contributions of historic smelter emission-related constituents were highest for near smelter sampling locations. The concentrations decreased with increasing distance from the former smelter resulting in moderate contributions for stock tank

sampling locations, and lesser contributions for upland drainage sampling locations. The distributions of constituent concentrations in STSIU soil samples also reflected the removal of the former smelter source.

The two levels of filtration (0.45 and 0.001-micron size fractions) were performed to better define the concentrations of metals that are truly biologically available. Metals associated with particulate and colloidal size fractions in surface water are generally not available for uptake by aquatic biota, and therefore, are not of ecological concern. Excluding sample SW05, concentrations of aluminum, cadmium, copper, and lead in ultra-filtered surface water samples were substantially lower than other size fractions and were generally below or close to chronic criteria.

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1.0 INTRODUCTION

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1.1 Background

The STSIU is primarily located within the San Vicente Basin (Figure 1). The basin includes upland drainage areas characterized by bedrock outcrops and limited vegetation and lowland areas characterized by several dry washes and gullies with sandy bottoms. Average annual precipitation recorded for the IU is 15.4 inches per year, with the majority of the rainfall occurring during the months of July, August, and September from high intensity thunderstorms. Field observations have indicated that surface water flow is generally ephemeral and intermittent which occurs during or shortly after significant rainfall events. However, potential perennial water pools were observed in Rustler Canyon. Surface runoff collects in ephemeral rainfall pools within the creek channels and is captured and stored in stock ponds built along the channels. These temporary surface water pools are collectively referred to as rainfall pools for the purpose of this investigation. The transportation of suspended or dissolved constituents in surface water runoff was identified within the

conceptual site model presented in the RI as a potential source of trace metals in rainfall pools (SRK, 2008).

Potential sources of suspended or dissolved constituents in STSIU surface water runoff include naturally occurring minerals in soil and bedrock, historic smelter emissions, and fugitive dust from handling of historic smelter materials and tailing. The ore body mined by Chino is a "porphyry copper" type of deposit common in the southwestern United States (SRK, 2008). The central zone of a typical porphyry copper deposit contains disseminated copper-molybdenum mineralization. Around this central deposit may be a "halo" of copper in veins. Farther out from the halo of copper veins are zones of mineralization that contain iron , zinc, lead, silver, and some copper. Mining at Chino takes place within the disseminated copper-molybdenum ore body. Constituents in Chino ore with concentrations above reference soil concentrations include copper, molybdenum, antimony, cadmium, chromium, and, marginally, lead and zinc. The halo of lead mineralization surrounding the copper mineralization is not encountered during mining for copper at Chino. Various other companies historically mined the lead-zinc-silver ore body primarily through the use of underground mining methods (Chino, 1995). A comparison of constituent concentrations in ore and concentrate with constituent concentrations in reference soil samples is provided in Section 4.0.

The original Hurley Smelter began operations in 1939 and included a single 500-foot high stack for emissions of various sulfide gas and particulate streams generated by the furnace and converters (Chino, 1995). A second 626-foot stack was constructed in 1967 as an air pollution control measure. Chino completed construction of the sulfuric acid plant in 1974 as part of Chino's air quality control plan to meet Federal ambient air standards and the State of New Mexico's Air Quality Control Regulations. In 1984, Chino completed a major modernization of the smelter facility to increase smelting capacity and to provide improved air quality control. Constituents detected in historic smelter emissions include antimony, arsenic, barium, cadmium, chromium, copper, lead, molybdenum, selenium, and silver (Chino, 1995). Smelter operations were shut down permanently in January 2001 and final demolition of the smelter facility occurred in 2007 (SRK, 2008).

As described above, dissolved concentrations of copper and other trace metals exceeded hardness-adjusted aquatic life criteria at most rainfall pool locations sampled during the 2004 and 2006 sampling events. The hardness-adjusted aquatic life criteria for copper and other trace metals are based on dissolved solute concentrations since it is the free ion forms of the metals that are most detrimental to aquatic biota. Characterizing dissolved trace metals concentrations using the standard 0.45 micron pore size filter potentially overestimates the concentrations of trace metals that are truly dissolved and, therefore, biologically available. Some of the trace metals that pass through a 0.45 micron pore size filter may be associated with dissolved organic matter, or with colloids such as amorphous aluminum or iron oxides and may not be biologically available. In addition, the hardness-adjusted criteria do not account for the strong binding potential of dissolved organic carbon (DOC) in surface water.

This investigation used ultra-filtration techniques to "screen out" trace metals that are not "truly" dissolved prior to analysis of the sample. DOC characterization, which also included

an estimation of the fulvic and humic acid content of DOC, was also conducted to evaluate the role of DOC in reducing concentrations of dissolved trace metals. The concentrations of dissolved metals were then re-evaluated to determine whether hardness-adjusted aquatic life criteria were still exceeded.

The 2006 investigation identified dissolved copper concentrations up to 0.055 mg/L in rainfall pools located in Lucky Bill, Rustler, and Martin Canyons (SRK, 2008). These areas are considered to have received minor contributions of constituents from historic smelter emissions relative to locations in close proximity to the former smelter. A statistical evaluation was conducted to compare the geochemical characteristics of soil and water samples collected in Lucky Bill, Rustler, and Martin Canyons to samples collected from other STSIU areas located closer to the former smelter that are known to have been impacted from historic smelter emissions. The statistical evaluations were used to determine whether there are similarities in relations between constituent concentrations in soil and surface water for different portions of the STSIU that could be attributed to historic smelter emissions. The conceptual site model will be revised, as needed, based on the results of this evaluation.

2.0 METHODS

Surface water samples were collected at 17 sampling locations during September 2007 (Figure 1). Surface water sampling location SW16 was not included in this investigation. This sampling location is located at the point of inflow to James Canyon Reservoir from Whitewater Creek (Figure 1). Since Whitewater Creek accepts runoff from a large area of land that is not included within the STSIU, this sampling location is not representative of potential historic smelter emission impacts to STSIU surface water. James Canyon Reservoir is regulated under Discharge Permit 214. Temperature, pH, specific conductance, turbidity, and dissolved oxygen (DO) were measured and recorded in the field at each sample location at the time of sample collection. Field measurements, observations, and photo log are provided in Appendix A.

Surface water samples were collected in accordance with the procedures provided in the Field Sampling Plan (SRK, 2004) and Standard Operating Procedures (SOP) 13 (*Field Sampling of Stream Channels, Springs and Seeps*) and SOP 17 (*Filtering of Water Samples*) of the Quality Assurance Plan (QAP) (SRK, 1997). To summarize, individual grab samples were collected at each location using one of two standard methods. For stock tank sampling, a clean plastic container was fixed to a long handle as a sampling device. The container was dipped directly into the water and the collected sample was poured into a 5-gallon cubitainer. For stream samples, the container was submerged directly into the stream for sample collection. All sample collection containers were triple-rinsed with sample water prior to collecting a sample. Dedicated sampling containers were used for each sampling location.

Field notes and logs accurately documented daily field activities. Each sample container was marked with the unique sample ID coinciding with the location and sample type (e.g., dissolved; 0.45 micron or ultra-filtered) and whether it was a field or QC sample, in addition to the sample date and time, and initials of the sampler.

Samples were transported on ice to the Chino on-site laboratory. For standard “dissolved” metals analysis, samples were filtered using 0.45 micron pore size acrylic polymer filters in disposable filter canisters obtained from Geotech Environmental Instruments. The canisters hold a reticulated 0.45 micron filter paper of 700cm^2 area. Sample was driven through the filter canisters using an electrical peristaltic pump and tygon tubing. A fresh canister and fresh tubing was used for each sample. The tygon tubing was decontaminated according to SOP 6 (*Decontamination of Equipment used to Sample Soil and Water*) presented in SRK (2004). The tubing was reused for multiple samples, and was sealed in zipper-lock bags when not in use. For ultra-filtration metals analysis, samples were pre-filtered using a 4-inch diameter 1.2 micron glass fiber filter placed with tweezers into a reusable glass filter paper holder. Sample for the 0.45 filtration was drawn with the tubing directly from the 5-gallon cubitainers. For the 1.2 micron filtration, sample was poured from the cubitainers into an open glass reservoir mounted atop the filter holder. After filtration and collection of each sample for chemical analysis, the containers were maintained at an approximate temperature of 4°C. Samples were packaged and handled so as to minimize the potential for contamination or breakage. All samples were handled and shipped pursuant to the SOPs, including SOP 5

(*Packaging and Shipping of Environmental Sample Containers*) and SOP 4, (*Sample Custody and Documentation Procedures*). Samples were maintained under Chain of Custody protocols at all times, including restricted access to all samples/containers before, during, and after sample collection. When samples/containers were not in direct possession of a project team member, they were locked or sealed in a secure area to prevent tampering. Laboratory data reports from ACZ are provided in Appendix B.

Samples collected for standard chemical analysis were submitted to ACZ Laboratories, Inc. (ACZ), located in Steamboat Springs, CO. Samples were analyzed for total and dissolved metals (aluminum, cadmium, copper, iron, lead, manganese), alkalinity, hardness, total organic carbon (TOC), dissolved organic carbon (DOC), major cations (calcium (Ca), potassium (K), magnesium (Mg), sodium (Na)), and major anions (sulfate (SO_4), nitrate (NO_3), chloride (Cl), and phosphorus (P)). Dissolved metals concentrations and dissolved organic carbon were characterized from analysis of samples filtered using standard filter pore size of 0.45 microns and ultra-filtration with effective pore size of approximately 0.001 microns.

Whole water samples (pre-filtered using a 1.2 micron pore size filter) were submitted to the University of Colorado INSTAAR Laboratory (INSTAAR), located in Boulder, CO, for additional characterization of dissolved organic matter using specific ultraviolet absorbance (SUVA) and for ultra-filtration under the direction of Dr. Diane McKnight (Breault et al., 1996; Kimball et al., 2004). Ultra-filtration was conducted using an ultra-filtration membrane with a surface area of 0.1 square meters (m^2) placed within a Millipore Pellicon Mini Cassette. Membrane area was based on the required membrane size for the ultrafiltration unit. The membrane used consisted of regenerated cellulose with a nominal molecular weight shut-off of 5,000 Daltons (approximately equivalent to 0.001-micron pore size). Based on previous research conducted by Dr. McKnight, there is a negligible difference between organic carbon retention characteristics for a 10,000 Dalton membrane and a 1,000 Dalton membrane. The 5000 Dalton membrane was selected to optimize filtration based on the expected molecular weight of the DOC as determined from the SUVA analysis and to optimize filtration time while still providing conservative low-molecular-weight organic carbon retention characteristics. Prior to use, each membrane was flushed with 8 liters of deionized water, cleaned with hydrochloric acid (HCl), sodium hydroxide (NaOH), and nitric acid (HNO_3), and flushed again with a minimum of 1 liter of deionized water for a minimum of one hour. This membrane conditioning procedure was conducted to reduce potential contributions of metals from or adsorption of metals to the ultrafiltration membrane. After the membrane was conditioned, the membrane was rinsed with 1 L of sample water that was recirculated for one hour to equilibrate the membrane with sample water. This rinse water was then discarded. After membrane equilibration with sample water, the sample reservoir was filled with 6 kg of sample water (±0.5 kg). The sample was pumped to the membrane using a peristaltic pump and silicone tubing that had been rinsed with a minimum of 1 liter of laboratory grade deionized water. Because only a small amount of permeate is generated relative to the volume of water introduced to the ultrafiltration unit, the retentate from the ultrafiltration unit was fed back to the reservoir and recirculated to the membrane until a total of 1 liter of permeate was collected for sample analysis. Permeate was collected into a pre-rinsed 1 liter HDPE sample container. After collection of 1 liter of sample, the sample container was

mildly agitated by hand to ensure complete mixing. Sample bottles provided by ACZ were filled directly from the 1 liter sample container. Due to the time required to pre-condition the ultrafiltration membranes and to collect 1 liter of permeate, some samples were held up to 5 months prior to ultrafiltration (Table 3). Prior to ultrafiltration, samples were stored at 4°C. Ultra-filtered samples were shipped to ACZ for analysis of aluminum, cadmium, calcium, copper, lead, and magnesium. Dissolved organic carbon concentrations and absorbance of ultraviolet light (UV) at a wavelength of 254 nanometers (nm) were measured at INSTAAR for whole water (1.2 micron filtered size fraction) and ultra-filtered samples.

Quality Control samples were collected in the same manner as the field samples and analyzed for the same chemical constituents to verify the quality of the analytical data generated. Specific analytical methods, along with data quality objectives, and laboratory data validation/usability criteria are referenced from the QAP adopted by Chino (SRK, 1997). SOPs relevant to this scope of work are contained within Appendix B of the *RI Proposal S/TSIU* (SRK, 2004).

Data validation was conducted in accordance with *Functional Guidelines for Inorganic Data Review* (USEPA, 1994) for all soil and water samples. The results of the data validation and data quality assessment conducted by Golder and Associates, Inc. are presented in Appendix C.

Analytical results are described in Section 3.0.

3.0 RESULTS

This section presents results of analyses conducted to further characterize surface water in the STSIU. Analytical results for total, dissolved (0.45 micron), and ultra-filtered metals, and other constituents are summarized in Table 1 and discussed below.

3.1 Major Constituents

Surface water pH ranged from 4.2 to 9.2 standard units (Table 1). Locations with pH values less than 6 were CDW-1 and SW05 (Figure 1). Surface water sampling location CDW-1 is located closest to the former smelter area and likely indicates impacts from historic smelter emissions.

Sample location SW05 is located in the upper portion of Rustler Canyon. The "Highway to Heaven" haul road, which was constructed using waste rock material, was built across the head of this drainage in the mid-1990's. Runoff from this road may have been impacting surface water quality in Rustler Creek. Chino has been working with NMED to address this potential source area and is in the final stages of remediating the haul road. To date, Chino has removed 201,330 tons of sulfidic material and placed it in the South Stockpile. Once the removal of the sulfidic material has been completed to the extent practicable, a lime slurry will be applied to buffer runoff from any remaining sulfidic material. Chino has retained a contractor to construct a lined capture system to collect impacted water from the seep and direct it by gravity flow to Dam 9. This work is scheduled to be completed before this monsoon season.

Locations with pH values greater than 9 were SW04 and SW14 (Figure 1). Sampling location SW04 is located on the west side of State Highway 180 and sampling location SW14 is located southeast of the former smelter. SW04 and SW14 are stock tank sampling locations.

Dissolved oxygen concentrations ranged from 3.7 to 9.8 mg/L (Table 1). Turbidity ranged from 0.4 to approximately 500 nephelometric turbidity units (NTUs) with higher turbidity generally measured at stock tank sampling locations. Specific conductance (SC) ranged from approximately 80 to 825 micro-Siemens per centimeter (μS/cm). The highest SC value, 825 μS/cm, was measured for the sample collected at SW05 in upper Rustler Canyon.

Alkalinity concentrations ranged from less than the detection limit of 2 mg/L to 120 mg/L (Table 1). Alkalinity concentrations were highest in surface water samples collected from middle and lower Martin Canyon, SW08 and SW07, respectively (Figure 1).

Sulfate concentrations ranged from less than the laboratory detection limit of 1 mg/L to 380 mg/L (Table 1). The highest sulfate concentrations were measured in two samples collected from upper and middle Rustler Canyon, SW05, and SW09, respectively (Figure 1). Sulfate was not detected in surface water collected from stock tanks, potentially indicating maintenance of reducing conditions within some portion of the stock tank water column.

Concentrations of chloride, nitrate, and phosphorus were low or were below laboratory detection limits (Table 1).

3.2 Metals

Comparisons of metals concentrations for different size fractions are provided in Table 1 and Figures 2 through 10. Concentrations that were below laboratory detection limits are shown as missing bars in Figures 2 through 10. As shown, decreases in metals concentrations for the successively smaller size fractions differed for the various analytes and with location, as described in more detail below.

Dissolved calcium concentrations (0.45-micron size fraction) ranged from 5.9 to 69.2 mg/L (Table 1 and Figure 2). Ultra-filtered calcium concentrations (0.001 micron size fraction) ranged from 4.1 to 69.9 mg/L. Calcium concentrations were similar for the two dissolved size fractions; calcium concentrations in ultra-filtered samples were approximately 69 to 100% of the calcium concentrations in 0.45 micron size fraction samples, with an average of 89%. Calcium in water is generally present as free ions and typically is minimally excluded by ultra-filtration (Kimball et al., 2004).

Dissolved magnesium concentrations (0.45-micron size fraction) ranged from 1.8 to 46.7 mg/L (Table 1 and Figure 3). Ultra-filtered magnesium concentrations ranged from 4.1 to 69.9 mg/L. Magnesium concentrations were similar for the two dissolved size fractions; magnesium concentrations in ultra-filtered samples were approximately 73 to 100% of the magnesium concentrations in 0.45 micron size fraction samples, with an average of 90%. Similar to calcium, magnesium in water is generally present as free ions and typically is minimally excluded by ultra-filtration (Kimball et al., 2004).

Hardness was calculated using dissolved calcium and magnesium concentrations for the 0.45 micron and ultra-filtration size fractions (Table 1). Hardness values ranged from 36.4 to 365 mg/L for dissolved (0.45-micron size fraction) samples and from 49 to 367.5 mg/L for ultra-filtered samples (Table 1). Surface water samples were mostly soft (hardness less than 75 mg/L) to moderately hard (hardness less than 150 mg/L), with the exception of very hard water (hardness greater than 300 mg/L) collected at surface water sampling location SW05. Hardness-adjusted acute and chronic criteria for cadmium, copper, and lead were estimated for dissolved (0.45 micron and ultra-filtration) sample fractions and are provided in Table 2 (NMWQCC, 2002). Concentrations of dissolved metals were compared with their respective hardness-dependent criterion. Surface water cadmium, copper, and lead concentrations that exceeded chronic aquatic life criteria are shown in bold font in Table 1 and are discussed in more detail below. To estimate the relative level of criteria exceedances, acute and chronic criteria ratios were calculated by dividing the measured constituent concentrations by their respective acute and chronic criteria (Table 2).

Iron concentrations ranged from less than the detection limit of 0.02 to 17.3 mg/L (Table 1) and varied substantially for the different size fractions (Figure 4). Total iron concentrations were greatest for samples collected from stock tanks (SW04 and SW11 through SW15) and were below the laboratory detection limit for upland drainage samples collected from lower

Rustler Creek (SW10) and middle and lower Martin Creek (SW08 and SW07). Dissolved iron (0.45-micron size fraction) concentrations were generally substantially lower than total iron concentrations with the exception of upland drainage surface water sampling locations SW05, SW09, and SW06A. Iron was detected in one ultra-filtered sample collected at upland drainage surface water sampling location SW05. These results indicate that a large fraction of the total iron in surface water samples is present in the particulate and colloidal phases (less than 0.45 micron size fraction) and is not biologically available.

Manganese concentrations ranged from less than the detection limit of 0.0005 mg/L to 4.64 mg/L (Table 1). The highest manganese concentrations were measured for surface water collected in upper Rustler Creek (SW05) (Figure 5). Total manganese concentrations greater than 0.1 mg/L were measured in samples collected at BD4W-1 and at several stock tanks (SW11, SW12, SW13, and SW14). Total and 0.45 micron size fraction manganese concentrations were similar for all sampling locations with the exception of stock tanks, where 0.45 micron size fraction manganese concentrations were typically an order of magnitude lower than total manganese concentrations. Ultra-filtered manganese concentrations were similar to total manganese concentrations for three sampling locations (BD4W-1, SW05, and SW09) and were below the laboratory detection limit of 0.0005 mg/L at seven locations (SW04, SW03, SW06A, SW07, SW08, SW12, and SW15). These results indicate that manganese geochemistry in rainfall pool samples is complex.

Aluminum concentrations ranged from less than the detection limit of 0.001 mg/L to 21.8 mg/L (Table 1). Total aluminum concentrations greater than or equal to 10 mg/L were measured in rainfall pool samples collected from four sampling locations (SW05, SW11, SW12, and SW13) (Figure 6). Dissolved aluminum concentrations were generally less than total aluminum concentrations with 0.45 micron and ultra-filtered concentrations averaging 34% and 17% of total aluminum concentrations, respectively. With the exception of sample SW01, aluminum was detected in all ultra-filtered samples. Nine sampling locations had dissolved (0.45 micron size fraction) aluminum concentrations that exceeded the chronic aquatic life criterion of 0.087 mg/L (SW04, SW01, SW02, SW05, SW06A, SW11, SW12, SW14, and SW15) (Table 1, Figure 6). However, only one sampling location (SW05) had an ultra-filtered aluminum concentration that exceeded the chronic aquatic life criterion. This sample also exceeded the acute aquatic life criterion of 0.75 mg/L and the livestock watering criterion of 5.0 mg/L for aluminum in both the 0.45 (Table 1). These results indicate that much of the aluminum in surface water is present in the particulate and colloid phases and present a low risk to aquatic life. The low pH of surface water at sampling location SW05, caused by drainage from the Highway to Heaven haul road, is maintaining dissolved aluminum at a concentration of potential concern in the ultra-filtered size fraction. As discussed earlier in this section, remedial measures are being implemented at Highway to Heaven to mitigate adverse effects on surface water quality.

Cadmium concentrations ranged from less than the laboratory detection limit of 0.0001 mg/L to 0.004 mg/L (Table 1). Total cadmium was detected in samples collected at eight sampling locations (BD4W-1, CDW-1, SW03, SW05, SW11, SW12, SW13, and SW14) (Figure 7). Dissolved cadmium was detected at four sampling locations (BD4W-1, CDW-1, SW05, and SW15), and at three of these locations (BD4W-1, CDW-1, and SW05) cadmium was detected

in the ultra-filtered samples. Detected concentrations of cadmium were similar for total and dissolved fractions (Figure 7). The concentration of cadmium detected in the CDW-1 0.45-micron and ultra-filtered samples exceeded hardness-dependent chronic aquatic life criteria (Table 1). The chronic criterion ratios were 1.3 and 1.03 for the 0.45-micron filtered and ultrafiltered samples, respectively (Table 2) for the CDW-1 sample indicating a minimal exceedance of the chronic criterion and a low risk from cadmium for all surface water sampling locations.

Total and dissolved (0.45 micron size fraction) copper concentrations ranged from 0.0026 to 1.22 mg/L and ultra-filtered copper concentrations ranged from less than the laboratory detection limit of 0.0005 mg/L to 1.14 mg/L (Table 1). Dissolved (0.45 micron size fraction) copper concentrations were similar to total copper concentrations, with the exception of stock tank sampling locations (SW04 and SW11 through SW15) which were an average of 30% of total copper concentrations (Table 1 and Figure 8). Copper is primarily present in the particulate size fraction in stock tank surface water. Detected ultra-filtered copper concentrations were generally substantially lower than total copper concentrations and averaged 10% of total copper concentrations with the exception of two outlier samples CDW-1 (52%) and SW05 (98%). For most non-stock tank sampling locations, copper is primarily present in the colloidal phase.

Dissolved (0.45 micron and ultra-filtered size fractions) copper concentrations at sampling location SW05 exceeded the livestock watering criterion of 0.50 mg/L (Table 1). Dissolved (0.45 micron size fraction) copper concentrations exceeded hardness-dependent chronic aquatic life criteria at 14 of the 17 sampling locations (Table 1 and Figure 8). All but one of these locations (SW09) exceeded their respective hardness-dependent acute aquatic life criteria as well. Samples collected in lower Rustler Creek (SW10) and middle and lower Martin Creek (SW08 and SW07) did not exceed the chronic or acute aquatic life criteria for dissolved (0.45 micron size fraction) copper. Eight sampling locations (CDW-1, SW04, SW05, SW06A, SW11, SW13, SW14, and SW15) had ultra-filtered copper concentrations that exceeded hardness-dependent chronic aquatic life criteria. All but one of these locations also exceeded their respective hardness-dependent acute aquatic life criteria. However, with the exception of sampling locations CDW-1 and SW05, the chronic criterion ratio values were less than 4.0 and the acute criterion ratio values were less than 3.0 (Table 2), indicating a relatively low risk from copper at most surface water sampling locations.

Lead concentrations ranged from below the laboratory detection limit of 0.0001 mg/L to 0.0105 mg/L (Table 1). Dissolved (0.45 micron size fraction) lead concentrations were generally substantially lower than total lead concentrations (Figure 9). Lead was minimally detected in only one ultra-filtration sample collected at SW05. At all sampling locations dissolved lead concentrations for both filtered size fractions were below hardness-dependent chronic and acute criteria (Table 1 and Figure 9), indicating a low risk from lead at all surface water sampling location.

3.3 Organic Carbon

Total organic carbon (TOC) concentrations ranged from 3 to 14 mg/L, dissolved organic carbon (DOC, 0.45 micron size fraction) concentrations ranged from 3 to 13 mg/L and ultra-filtered DOC concentrations ranged from 1.5 to 6.6. mg/L (Table 1). Concentrations of TOC and DOC (0.45 micron size fraction) were similar for most samples (Figure 10). However some stock tank locations had DOC concentrations that were lower than TOC concentrations. Concentrations of DOC in the whole water samples shipped to INSTAAR (1.2-micron size fraction) were similar to TOC and DOC concentrations (0.45-micron size fraction) indicating that SUVA analyses on whole water samples, described below, are reasonably representative of SUVA for DOC (0.45-micron size fraction). Ultra-filtered DOC concentrations were approximately one half of TOC concentrations with a range of 31% to 82% of TOC concentrations, indicating that a substantial amount of organic carbon is still present in the ultra-filtered size fraction. Although organic carbon is generally retained in the 0.45 micron size fraction, approximately 20 to 70% of DOC is present in the colloidal size fraction between the 0.45 micron and ultra-filtered size fractions and is removed from water during ultra-filtration. DOC present in the ultra-filtered size fraction (approximately 30 to 80% of total organic carbon) may provide some binding sites for dissolved metals present in the ultra-filtered size fraction.

Absorbance of UV light at a wavelength of 254 nm was measured for DOC samples (Table 3). SUVA is the absorbance of a water sample at a given wavelength of UV light (254 nm in this case) normalized for DOC concentration and is reported in units of $L*mg\ C^{-1}*m^{-1}$. SUVA-254 values for surface water samples ranged from 1.89 to 19.47 $L*mg\ C^{-1}*m^{-1}$ for the 1.2-micron size fraction and from 1.15 to 2.62 $L*mg\ C^{-1}*m^{-1}$for the ultra-filtered size fraction.

SUVA determined at a wavelength of 254 nm is an “average” absorptivity for all organic carbon molecules in a water sample and is indicative of the dissolved aromatic carbon content in aquatic systems (Weishaar et al., 2003). Higher SUVA-254 values indicate higher aromatic content. Aquatic humic substances are the primary source of aromatic organic carbon in surface water samples. SUVA-254 values greater than 2.0 $L*mg\ C^{-1}*m^{-1}$ generally indicate the presence of humic acids in DOC samples. SUVA-254 values less than about 2.0 $L*mg\ C^{-1}*m^{-1}$ generally indicate the presence of non-labile fulvic acids in DOC samples. This non-labile fulvic acid fraction tends to be less reactive with respect to binding of metals (Weishaar et al., 2003).

Samples collected from stock tanks generally had elevated SUVA-254 values in the 1.2-micron size fraction relative to other sampling locations, indicating the strong presence of aromatic humic acids in DOC samples collected from the stock tanks. The only samples with ultra-filtered size fraction SUVA-254 values greater than 2.0 $L*mg\ C^{-1}*m^{-1}$ were collected at stock tank sampling locations SW13, SW14, and SW15, indicating that some low molecular weight aromatic humic acid fractions of DOC may have passed through the ultra-filtration membrane. Two other stock tank sampling locations, SW04 and SW11, had SUVA-254 values greater than 1.9. Water samples collected at these five stock tanks had ultra-filtered copper concentrations that exceeded their respective hardness-adjusted chronic criteria.

Copper in the ultra-filtered size fraction in water collected from SW12 did not exceed its respective chronic criterion and had a SUVA-254 value of 1.15. Copper in the ultra-filtered size fraction of water samples collected from the other five stock tanks (SW04, SW11, SW13, SQW14, and SW15) may be associated with low levels of aromatic DOC that is low enough in molecular weight to pass through the ultra-filtration membrane.

3.4 Trilinear Diagrams – Water Type

Trilinear diagrams, also frequently referred to as Piper diagrams (Piper, 1944), were developed to evaluate the relative composition of major ions (Ca, Mg, Na+K, SO4, Cl, and carbonate (CO_3) + bicarbonate (HCO_3)) for surface water samples collected during this investigation. A Piper diagram provides a convenient method to classify and compare water types based on the ionic composition of different water samples (Hem, 1985). Major cation and anion concentrations for each surface water sample were converted to total milli-equivalents per liter (meq/L) and plotted as percentages of their respective totals in two triangles (Figures 11 – 13). The cation and anion relative percentages in each triangle are then projected into a quadrilateral polygon that describes the water type or hydrochemical facies. Each symbol on the plots represents a single surface water sample.

Piper diagrams were developed for "upland drainage" sampling locations (SW01, SW02, SW03, SW05, SW06A, SW07, SW08, SW09, and SW10) (Figure 11), "stock tank" sampling locations (SW11, SW12, SW13, SW14, and SW15) (Figure 12), and "near smelter" sampling locations (SW04, BD4W-1, and CDW-1) (Figure 13). These sample groupings were based on geographical proximity of the surface water sampling locations to the former smelter. As shown on Figure 11, upland drainage surface water samples are primarily calcium-magnesium carbonate type waters (Ca,Mg–CO_3) and calcium-magnesium sulfate (Ca,Mg–SO_4) type waters. Ca,Mg–SO_4 type waters were identified for the three samples collected from Rustler Creek (SW05, SW09, and SW10), potentially indicating addition of sulfate to Rustler Creek from weathering of waste rock contained in the Highway to Heaven haul road located at the head of the drainage. As discussed earlier in this section, remedial measures are being implemented at Highway to Heaven.

Surface water samples collected at stock tank sampling locations are classified as calcium carbonate (Ca–CO_3) type waters (Figure 12). Surface water samples collected at near smelter sampling locations are classified as Ca–CO_3 (SW04) and Ca–SO_4 (BD4W-1 and CDW-1) type waters. The Ca–SO_4 type water for near smelter sampling locations BD4W-1 and CDW-1 is consistent with expected effects of historic smelter emissions on surface water composition. The Ca–CO_3 type water for stock tanks (including stock tank sampling location SW04) is consistent with carbonate minerals present in soils derived from the Gila formation bedrock present in the vicinity of the stock tanks.

3.5 Summary

The Chino porphyry copper ore contains copper, molybdenum, antimony, cadmium, lead, and chromium at concentrations above reference soil concentrations. Antimony, arsenic, barium, cadmium, chromium, copper, lead, molybdenum, selenium, and silver were measured in

historic smelter emissions when the smelter was operating (previous to 2001) (Chino, 1995) and can be used as a "fingerprint" to identify potential historic smelter emission impacts.

The following bullets summarize analytical results for STSIU surface water samples:

- Surface water in the STSIU is classified as soft to moderately hard, with hardness values typically less than 150 mg/L. Water types range in composition between Ca,Mg–CO_3, Ca,Mg–SO_4, Ca–CO_3, and Ca–SO_4 water types.

- Surface water sampling location SW05 is located on Rustler Creek down gradient from the Highway to Heaven haul road that was built across the head of the Rustler Canyon drainage. Concentrations of aluminum and copper in SW05 surface water exceeded chronic ambient aquatic life criteria. Waste rock used in the construction of Highway to Heaven is the likely source of low pH and elevated metals at this sampling location. Remedial activities are currently underway for the Highway to Heaven haul road, and completion of these remedial activities in 2008 is expected to improve the water quality in Rustler Creek.

- Aluminum is primarily present in the filterable (greater than 0.45-micron) size fraction. Aluminum is not a major constituent of Chino ore and was not listed as being associated with historic smelter stack emissions (Chino, 1995). Aluminum presents a low risk to aquatic life in STSIU surface water.

- Cadmium was generally excluded from the filtered (0.45 micron and ultra-filtered) size fractions with the exceptions of dissolved cadmium concentrations for surface water samples collected at SW05, CDW-1, and BD4W-1. The CDW-1 ultra-filtered cadmium concentration was 0.0009 mg/L and minimally exceeded the hardness-adjusted chronic criterion of 0.00087 mg/L. Ultra-filtered cadmium concentrations for the CDW-1 and BD4W-1 samples were below their respective hardness-adjusted chronic and acute criteria. Cadmium presents a low risk to aquatic life in STSIU surface water.

- Copper concentrations generally decreased with decreasing filtered size fraction. However, ultra-filtered copper concentrations exceeded the respective hardness-adjusted criteria at eight surface water sampling locations. Chronic criteria ratios were less than 4.0 for all but two of the sampling locations, CDW-1 and SW-05. In general, copper in surface water presents a relatively low risk to aquatic life in STSIU surface water.

- Concentrations of dissolved lead in all surface water samples were below acute and chronic hardness-adjusted aquatic water quality criteria. These data are consistent with the fact that lead is not a major constituent in Chino ore. Lead in surface water presents a low risk to aquatic life in STSIU surface water.

- Approximately 30 to 80 percent of DOC was retained in the ultra-filtered size fraction. SUVA results indicate that DOC retained after ultra-filtration was comprised primarily of non-aromatic compounds.

The implications of these analytical results are discussed in the Conceptual Site Model (CSM) presented in Section 5.0.

4.0 STATISTICAL EVALUATION

A statistical data evaluation was conducted to evaluate the relations between surface water solute concentrations and between soil metals concentrations for different areas of the STSIU. The primary goal of the statistical data evaluation was to classify samples on the basis of their chemical characteristics. Statistical techniques were employed to determine whether samples could be accurately classified into designated end-member categories, such as historic smelter emission impacts or natural background conditions, based on their respective chemical signatures.

Available surface water data and select soil sample data were evaluated by initially grouping the data by sample types and by parameters. Initial sample groupings were based on geographical proximity to the former smelter and included “upland drainage”, “stock tank” (excluding stock tank sampling location SW04), and “near smelter” (including SW04) sample location areas as previously defined in this report for surface water.

Soil samples selected for the statistical evaluation were chosen to be representative of areas that could potentially contribute runoff to the surface water sampling locations. Soil sample groupings included “upland drainage”, “stock tank”, “near smelter”, and “near SW04”. The near smelter and near SW04 soil sample groups were separated due to the distinct geomorphic setting for the surface water sampling location SW04 compared with CDW-1 and BD4W-1. Soil data were compiled from the STSIU RI report (SRK, 2008). Sample IDs for selected soil samples are as follows:

- Upland drainage soil samples – SS99, SS100, SS102, SS108, SS113, SS114, SS119S, SS120, SS123, ERA162, ERA163, ERA164, ERA165
- Stock tank soil samples – SS122, SS125S, SS129S, SS130, SS131S, SS132, SS139, SS143, SS149,
- Near smelter soil samples – S35, S36, S37, S38, S39, S40, S43, S44, S48
- Near SW04 soil samples – S6, S11, S12, S13, S17, S18, S19, S20, S21, S22

Soil sample locations are shown on Figure 3-5 in the STSIU RI Report (SRK, 2008).

Prior to statistical testing and evaluation, the raw data were conditioned, as warranted, by substituting the highest instrument detection limit for measured sample concentrations below the laboratory detection limit. The statistical data evaluation portion of this investigation included generation of summary descriptive statistics for the analyte concentrations in each sample group, development of correlation matrices for sample groups by analyte, and discriminant analysis for classification of individual soil samples within groups. Discriminant analysis was not performed for surface water samples due to the limited number of detected concentrations of trace metals in surface water (SRK, 2008). Surface water data for sampling location SW05 were not included in the summary and correlation statistical analyses due to impacts from the Highway to Heaven haul road that are clearly not related to potential

impacts from historic smelter emissions. As discussed in Section 3.0 above, the potential source areas in Highway to Heaven are being remediated and impacted seep water will no longer be allowed to drain toward Rustler Creek.

The following sections provide descriptions of the methods followed and the results for each of these statistical techniques.

4.1 Summary Statistics

Summary descriptive statistics (i.e., minimum, maximum, mean, geometric mean, and standard deviation) were developed for surface water and for soil constituent concentrations within sample groups and are provided in Tables 4 and 5 for surface water and soil, respectively. To account for potential skewing of mean metals concentrations by possible outliers, both mean and geometric mean concentrations were compared across sample location groups for surface water and soil. Highlights of the summary statistics are described below.

Surface Water Samples

For surface water samples, total and dissolved concentrations of cadmium and copper were generally higher in samples collected from near smelter sampling locations (Table 4). Total concentrations of aluminum, iron, lead, and manganese were higher at stock tank locations compared with other sampling locations. These constituents may be present in colloidal form and suspended particulate matter in stock tank surface water; turbidity of stock tank surface water samples was elevated relative to other STSIU surface water sampling locations (Table 1). Calcium concentrations were similar for all three sample groups and magnesium and sodium concentrations were generally higher at upland drainage sampling locations compared with other sampling locations.

Alkalinity and total and dissolved organic carbon concentrations were lowest at near smelter sampling locations (Table 4). The pH of stock tank water samples was generally neutral to alkaline, consistent with higher alkalinity, and the sampled water was moderately colored (sample descriptions provided in Appendix A), consistent with higher total organic carbon in the stock tank samples. Concentrations of sulfate were elevated in samples collected from the three Rustler Creek sampling locations, located down-gradient from the Highway to Heaven haul road located at the head of the drainage (Table 1 and Figure 1). Sulfate was not detected in samples collected at stock tanks (including SW04) or from Martin Creek (Table 1).

Soil Samples

For soil samples, concentrations of antimony, arsenic, barium, cadmium, copper, lead, molybdenum, nickel, selenium, silver, thallium (Tl), and zinc were highest for soil samples collected from near smelter sampling locations including SW04 samples (Table 5). Concentrations of these constituents were elevated above upland drainage and stock tank sample concentrations by factors of approximately 1.5 to 3 (antimony, arsenic, barium, lead, nickel, thallium, and zinc), approximately 5 to 10 (cadmium, molybdenum, and silver), and approximately 10 to 20 (copper). Concentrations of chromium, cobalt, magnesium,

manganese, and vanadium were slightly higher in upland drainage soil samples compared with other sampling locations (Table 5). Iron concentrations in upland drainage and stock tank soil samples were slightly higher than iron concentrations in near smelter and SW04 soil samples.

Six reference soil samples (ERA16 through ERA21) were collected in 1999 to support the ecological risk assessment (Newfields, 2005 and 2007) and represent soils that are assumed not to be impacted by historic smelter emissions or tailing (SRK, 2008). These reference soil samples were selected for comparison with STSIU soils because surface water in the STSIU poses a potential ecological risk as opposed to a human health risk. A qualitative comparison of reference soil constituent concentrations with concentrations of constituents in Chino ore and concentrate, and STSIU soil samples (non-reference samples) is provided in Table 6. For the purposes of this evaluation, ore, concentrate, and soil constituent concentrations 1.5 times greater than the maximum reference soil constituent concentrations were considered to be elevated with respect to reference soils.

As shown in Table 6, low-grade Chino ore had concentrations of copper, antimony, cadmium, chromium, lead, molybdenum, and zinc that were elevated with respect to concentrations of these constituents in reference soil samples. Lead and zinc in the Chino ore sample was only slightly elevated above reference soil concentrations, with ore lead and zinc concentrations 1.6 and 1.5 times higher than reference soil sample lead and zinc concentrations, respectively (Table 6). Chino concentrate had concentrations of copper, antimony, arsenic, cadmium, cobalt, lead, nickel, and selenium that were elevated with respect to concentrations of these constituents in reference soil samples (Table 6).

Soil samples collected near the historic smelter, but not included in the “near smelter” or “near SW04” sample groups, had concentrations of copper, arsenic, cadmium, cobalt, lead, molybdenum, selenium, silver, and zinc that were elevated with respect to reference soil samples (Table 6). These constituents were also detected in Chino concentrate and historic smelter emissions. Concentrations of lead in soil samples collected near the historic smelter had a limited number of samples (5%) with lead concentrations that exceeded reference soil lead concentrations by more than a factor of 1.5. Based on this result, lead is not considered to be a strong “fingerprint” constituent for identifying historic smelter impacts in soil. Therefore, copper, arsenic, cadmium, cobalt, molybdenum, selenium, and silver provide a potential “fingerprint” for identifying impacts to soil from historic smelter emissions.

For the “near smelter” and “near SW04” sample groups, concentrations of copper and silver in soil were elevated with respect to concentrations of these constituents in reference soil samples (Table 6). In addition, concentrations of molybdenum and selenium were elevated in near smelter soil samples, and concentrations of cadmium and zinc were elevated in near SW04 soil samples with respect to concentrations of these constituents in reference soil samples. These constituents (copper, cadmium, molybdenum, selenium, and silver) were also detected in other soil samples collected near the former smelter. However, concentration of these constituents in “near smelter” and “near SW04” were substantially lower than concentrations detected in soil samples collected from closer to the former smelter (Table 6).

These results are consistent with expected declines in soil concentrations with distance form the former smelter.

For stock tank soil samples, copper was elevated above reference soil concentrations by a factor of 2.5. No other constituents in stock tank soil samples had concentrations that were elevated with respect to reference soil concentrations (Table 6). The stock tank soil sampling locations are located further from the former smelter than near smelter and near SW04 soil samples and copper concentrations in stock tank soil samples were substantially lower, demonstrating further declines in copper concentrations with distance from the former smelter.

For upland drainage samples, only two samples had chromium concentrations that were elevated above reference soil concentrations, one sample had a lead concentration that was elevated above reference soil concentrations, and one sample had a zinc concentration that was elevated above reference soil concentrations (Table 6). Chromium, lead, silver, and zinc concentrations in these upland drainage soil samples exceeded reference soil concentrations by factors of 2.5, 3, and 5, respectively (Table 6). No other constituents in upland drainage soil samples had concentrations that were elevated with respect to reference soil concentrations (Table 6). The constituents in near smelter and near SW04 soil samples that were elevated with respect to reference soil sample concentrations (copper, cadmium, molybdenum, selenium, and silver) did not overlap significantly with the constituents in upland drainage soil samples that were elevated with respect to reference soil sample concentrations (chromium, lead, and zinc). These data indicate that potential effects from historic smelter emissions are not evident for chromium, lead, silver, and zinc in upland drainage soil samples. A potential explanation may be that this sample is showing effects from a mineralized zone near the copper-porphyry deposit.

4.2 Correlation Matrices

Correlation matrices provide insight into the interrelation of variables among a group. Correlation coefficients can range between 1 and -1 with values of 1 indicating a perfect direct relationship between two variables and values of -1 indicating the variables change inversely with relation to each other. Between the two extremes is a spectrum of less-than perfect relationships, including zero, which indicates the lack of any sort of linear relationship at all (Davis, 1986). Correlation matrices were calculated for three surface water sample groupings and four soil sample groupings (Table 7 and 8). Correlation coefficients with values greater than 0.8 or less than -0.8 were considered to have a significant correlation between variables and are described below for select variables.

Surface Water

Aluminum and iron were positively correlated and calcium and magnesium were positively correlated for upland drainage surface water samples (Table 7). These constituents are abundant in native soil and their presence in upland drainage surface water appears to be naturally occurring. Total and dissolved (0.45-micron size fraction) copper were correlated with total and dissolved organic carbon. Copper was not strongly correlated with any other constituents. Total and dissolved copper and organic carbon concentrations in upland

drainage water samples were similar, but copper and organic carbon concentrations declined after ultra-filtration. SUVA-254 values also decreased between the 1.2 micron and ultra-filtered size fractions (Table 3), indicating a loss of aromatic carbon that could have been providing copper binding sites in the colloidal size fraction. Copper in upland drainage soils may be binding with organic matter in soil prior to transport to surface water.

For stock tank surface water samples, total aluminum, copper, iron, lead, and turbidity were positively correlated (Table 7). The correlation of turbidity with these constituents likely indicates the presence of particulate matter containing these constituents in stock tank surface water. Dissolved (0.45-micron size fraction) concentrations of aluminum, copper, iron, and lead were substantially lower than total concentrations, indicating that these constituents were indeed included in particulate matter. Total cadmium was not correlated with any other total metal. However, this may be an artifact of an elevated detection limit for cadmium for sample SW15. Removal of this sample resulted in positive correlations with copper and lead (results not shown). Surface water pH was moderately and negatively correlated with total copper, iron, and lead concentrations, but was not correlated with filtered concentrations of these constituents.

For the near smelter surface water samples, the small sample size (three) makes interpretation of the correlations less certain (Table 7).

Soil Samples

For upland drainage soil samples, aluminum was positively correlated with calcium, cobalt, iron, magnesium, nickel, sodium, and vanadium (Table 8). With the exception of calcium and nickel, mean concentrations of these constituents were highest or second highest for upland drainage soil samples compared with the other soil sampling location groups, potentially indicating a natural background source in soil for these constituents (Table 5). Cadmium, lead, silver, and zinc were correlated in upland drainage soil samples. These correlations are driven by elevated concentrations of these constituents in the ERA162 soil samples compared with concentrations of these constituents in other Upland Drainage soil samples. Since soil sample ERA162 was collected near the Lucky Bill Canyon road, these results potentially indicate contributions from mining materials tracked in on tires of mining vehicles that are used to maintain the road.. Cadmium, lead, silver, and zinc have not been measured above concentrations of concern in upland drainage surface water samples (Table 1 and SRK, 2008). Soil copper concentrations in the upland drainage soil samples were not correlated with any other soil constituents. The lack of correlation of copper with other historic smelter emission constituents may indicate that copper is the only historic smelter emissions-related constituent that was transported in sufficient quantities to upland drainage soil samples.

For stock tank soil samples, copper was correlated with aluminum, arsenic, cadmium, chromium, cobalt, iron, lead, magnesium, nickel, vanadium, and zinc. Copper, and to a lesser extent arsenic, cadmium, chromium, lead, and zinc are expected to be potentially derived from historic smelter emissions (Table 6). Of these correlated constituents, only copper concentrations were elevated in stock tank soil samples with respect to reference soil samples.

Aluminum, chromium, cobalt, magnesium, vanadium, and zinc were correlated for near smelter soil samples (Table 8). Copper and cadmium were correlated with each other and lead, arsenic, and barium correlated as a group. Copper and cadmium have elevated concentrations in near smelter soil sampling locations compared with reference soil samples. Consistent with STSIU RI findings (SRK, 2008), these results likely indicate contributions of metals to soil from historic smelter emissions.

For the SW04 soil samples, cadmium, lead, and zinc were correlated; copper, barium, cobalt, iron, and silver were correlated; and lead, arsenic, cadmium, silver and zinc were correlated. Strong correlations among these constituents likely indicate contributions of these constituents to near SW04 soil from historic smelter emissions.

4.3 Discriminant Analysis

An evaluation of the inter-relations between multiple variables was accomplished through the use of the Discriminant Analysis (DA) statistical method. Discriminant analysis is a multivariate parametric statistical technique which allows evaluation of the differences between two or more groups of samples with respect to several variables simultaneously (Klecka, 1984). Discriminant analysis was used to evaluate grouping of soil sample types based on measured concentrations of constituents to discern whether constituents that best described variance in soil constituent concentrations also explained variance in surface water constituent concentrations.

Although a considerable number of discriminant analysis runs were conducted to learn the behavior of the data within the model, only two selected model runs are presented within this report. Full model outputs for the two model runs are provided in Appendix D. The two discriminant function models included in this report are as follows:

- Model 1: All variables included with the exception of variables with a large proportion of non-detect values (antimony, boron, mercury, selenium, and thallium) and variables with strong cross-correlation (aluminum, cadmium, and zinc).

- Model 2: Same as Model 1 with copper removed from the model and aluminum, cadmium, and zinc included in the model.

Discriminant analysis model runs were conducted using SYSTAT (2004). The backward stepwise procedure was employed. For the backward stepwise procedure, all variables are included in the run initially; then all variables are checked for significance at each step. The least significant variable is then removed at each step. The stepwise procedure is a logical and efficient way to produce an optimal set of discriminating variables. Discriminant analysis output parameters presented below and in Appendix D include the classification matrix, canonical variables, canonical scores plots, and eigenvalues. In the classification matrix, each sample is classified into the group where the value of its classification function is largest (i.e., into which group does an individual sample best fit?). The greater the overall percentage of correctly classified samples within a group, the greater the discrimination or separation of the different sample groups and the individual samples within those groups.

Canonical variables (or factors) are linear combinations of variables that best discriminate amongst the groups. For example, the first factor will contain the variables that provide the greatest amount of separation between groups, the second factor is orthogonal to the first factor and is the next best combination of variables, and so on. Canonical scores plots show the canonical variables (factors) and the points on the graph are the canonical variable scores for each sample (see Figure 14 for an example of a Canonical scores plot). The ellipses surrounding the group samples are centered on the centroid of each group. Outlier samples will fall outside of the group ellipse. Eigenvalues provide a relative indication of the amount of difference among groups that is captured by each of the associated factors. Results of the best fit discriminant analysis for Model 1 and Model 2 runs are provided below.

Soil Model 1

In the Model 1 run (with all variables included with the exception of variables with limited numbers of detections or with cross-correlations), there was clear separation of samples into their appropriate sample groupings (e.g., stock tank samples plotted within the stock tank group and near smelter samples plotted within the near smelter sample group) (Figure 14). Factor 1 was most strongly associated with copper. This constituent had the largest relative range of concentrations in soil samples (Table 5) and describes most of the variance in the data set. Factor 2 was associated with molybdenum and pH. With cadmium removed from the model due to cross-correlation with copper, molybdenum and pH were the next variables with the greatest amount of variance. Both of these constituents have distinctly different concentrations for near smelter samples compared with other sampling locations, with higher concentrations of molybdenum and lower pH values for near smelter samples. Factor 3 was associated with manganese. Concentrations of manganese were highest in soil samples collected from upland drainage sampling locations.

Soil Model 2

Because copper dominated the first factor for all models tested (results shown for Model 1 only), copper was excluded from the Model 2 run to better assess relations among the other variables. For Model 2, Factor 1 was most strongly associated with pH (Figure 15). Soil pH has a high level of variability between the sample location groups, as well as within the near smelter and stock tank sample groups (Table 5). Factor 2 was associated with arsenic, barium, cadmium, and molybdenum, which were identified as constituents potentially associated with historic smelter emissions, based on the distribution of their concentrations among the different soil sample location groups (Tables 5 and 6). Factor 3 was associated with manganese, magnesium, aluminum, and cobalt (Figure 15). These constituents were relatively elevated in upland drainage soil samples compared with other sampling locations (Table 5).

Both models indicated clear separation of the sample groups indicating statistically significant differences in the distribution of constituents in sample group soils. That is, each of the soil sample groups represents distinct populations. The implications of the results of the statistical evaluation are discussed in the Conceptual Site Model (CSM) presented in Section 5.0.

5.0 CONCEPTUAL SITE MODEL

As described above, detected concentrations of copper and other trace metals were observed in rainfall pool samples collected from STSIU surface water sampling locations during the September 2007 sampling event. A CSM was developed to better understand the transport and fate of copper and other trace metals in STSIU surface water. A conceptual site model is a concise summary of site conditions; an integration of factors that are relevant to COC fate and transport. A summary of results from this investigation, and an interpretation of their relevance for understanding fate and transport of metals in surface water are provided below.

Constituents detected in historic smelter emissions include antimony, arsenic, barium, cadmium, chromium, copper, lead, molybdenum, selenium, and silver (Chino, 1995). Copper, molybdenum, antimony, cadmium, chromium, and zinc were detected in low-grade ore at concentrations that were elevated with respect to reference soil samples (Chino, 1995). These constituents can be used to trace potential contributions of metals to STSIU soil and surface water from historic smelter operations.

With few exceptions, iron, aluminum, cadmium, and lead in surface water samples were readily removed via standard filtration methods (Table 1 and Figures 4, 6, 7, and 8). Exceptions included iron, aluminum, cadmium, and lead for surface water sample location SW05, and for cadmium at surface water sampling locations CDW-1 and BD4W-1. Results for manganese were mixed, with concentration declining after standard filtration for some locations, but not for others (Table 1 and Figure 5).

Surface water sampling location SW05 is located on Rustler Creek down gradient from the Highway to Heaven haul road. Because the elevated concentrations of constituents in surface water at SW05 are clearly not related to historic smelter emissions, this sampling location will not be included in further discussions of the CSM.

Dissolved (0.45-micron size fraction) concentrations of copper exceeded acute and chronic ambient water quality criteria at most STSIU surface water sampling locations (Table 1 and Figure 8). Aluminum, cadmium, and lead exceeded acute and chronic ambient water quality criteria at select STSIU surface water sampling locations (Table 1 and Figures 6, 7, and 9). However, after ultra-filtration of surface water samples, the number of sample locations with concentrations that exceeded acute and chronic ambient water quality criteria declined substantially. Surface water sampling locations with ultra-filtered sample concentration exceedances of water quality criteria, excluding sampling location SW05, are as follow:

- Cadmium – CDW-1
- Copper – CDW-1, SW04, SW06A, SW11, SW13, SW14, and SW15

The ultra-filtered cadmium concentration for sample CDW-1 was 0.0009 mg/L and minimally exceeded the chronic criterion of 0.00087 mg/L. Chronic criterion ratio values for copper were less than 4.0 with the exception of surface water sample CDW-1 which had a chronic

criterion ratio value of 41 (Table 2). Aluminum and lead concentrations in ultra-filtered surface water samples did not exceed their respective chronic criteria.

Metals associated with particulate and colloidal size fractions in surface water are generally not available for uptake by aquatic biota, and therefore, are not of ecological concern. The two levels of filtration (0.45 and 0.001-micron size fractions) were performed to better define the concentrations of metals that are truly biologically available. The results of the September 2007 sampling event indicate that with the exception of copper and manganese at some locations, metals are readily removed from surface water via filtration (0.45-micron filter pore size) and especially via ultra-filtration of surface water samples. The filterable metals are primarily associated with the particulate (greater than 0.45-micron) and colloidal (less than 0.45 micron and greater than 0.001 micron) size fractions.

Approximately 30 to 80 percent of DOC was retained in the ultra-filtered size fraction (Tables 1). SUVA results indicate that DOC retained after ultra-filtration was comprised primarily of non-aromatic organic compounds (Table 3). Although these retained DOC fractions are typically less aromatic, and therefore have fewer binding sites, the high percentage of DOC that is retained in water after ultra-filtration may still provide sufficient binding sites to retain copper in “solution”, especially for samples with ultra-filtered SUVA values close to or greater than 2.0.

Stock tank sampling locations with surface water copper concentrations that exceeded their respective chronic criteria (SW04, SW11, SW13, SW14, and SW15) also had ultra-filtered SUVA values greater than 1.9. If the copper in stock tank surface water is bound with lower molecular weight aromatic DOC that is passing through the ultra-filtration membrane, then it would be in a form that may be less bioavailable to aquatic biota than is the free cupric ion (Cu^{2+}). Potential risk from copper may, therefore, be even less than suggested by the chronic criterion ratio values of 1.2 to 3.7 for stock tank surface water (Table 2). However, additional investigation may be required to evaluate potential toxicity of the DOC-bound copper in STSIU surface water.

In summary, metals are readily removed via filtration, with the exception of copper at some locations. With few exceptions, the chronic criteria ratio values for ultra-filtered sample concentrations that exceeded chronic ambient water quality criteria were low (less than 4.0).

Concentrations of total and dissolved copper were higher in near smelter surface water samples compared with other sampling locations (Table 4). Concentrations of aluminum, iron, lead, manganese, alkalinity, TOC, DOC, and turbidity were higher in stock tank surface water samples compared with other sampling locations. The elevated turbidity indicates that some portion of metals and organic carbon likely are associated with particulate matter in the water column.

Concentrations of antimony, arsenic, barium, cadmium, copper, lead, molybdenum, nickel, selenium, silver, thallium, and zinc were higher in soil samples collected from near smelter and near SW04 sampling locations compared with upland drainage and stock tank soil sampling locations (Table 5). These constituents were generally detected in low-grade ore, concentrate, and/or historic smelter emissions (Chino, 1995) and presence of these

constituents in near smelter and near SW04 soil likely indicate contributions from historic smelter emissions. Concentrations of barium, lead, nickel, and thallium for samples collected in the vicinity of the former smelter were generally not elevated above concentrations of these constituents in reference soil samples (Table 6) (SRK, 2008). Concentrations of arsenic, cadmium, cobalt, copper, molybdenum, selenium, silver, and zinc in soil in the vicinity of the former smelter were elevated above reference soil concentrations for these constituents.

Concentrations of aluminum, chromium, cobalt, magnesium, manganese, and vanadium were higher in upland drainage soil samples compared with other STSIU soil sampling locations (Table 5), and aluminum, calcium, cobalt, iron, magnesium, nickel, sodium, and vanadium were correlated, potentially indicating natural background conditions for concentrations of these constituents in upland drainage soil. There were detections of chromium, lead, and zinc that were elevated above reference soil concentrations of these constituents for one upland drainage sampling location (ERA162). These constituents, along with cadmium, were also correlated with each other. Detection of these constituents in upland drainage soil sample ERA162 at concentrations that are elevated with respect to reference soils may represent contributions from mining materials tracked in on tires of mining vehicles that are used to maintain the road.

Copper in upland drainage soil was not correlated with any constituents and copper in surface water was correlated only with organic carbon. Concentrations of copper and other historic smelter emission-related constituents decreased with increasing distance from the former smelter. Copper was the only constituent with concentrations in near smelter soil samples that were elevated above reference soils by a factor of greater than 10 (Table 6). The lack of correlation of copper with other historical smelter emission constituents may indicate that only copper from historical smelter emissions was transported in sufficient quantities to be statistically significant in upland drainage soil. Copper transported to upland drainage soil from historic smelter emissions may be binding with organic matter in soils and subsequently transported to surface water during runoff events. For most upland drainage surface water sampling locations, the copper is readily removed from the sample via ultra-filtration, indicating that copper in upland drainage surface water is associated with the colloidal size fraction (including dissolved organic carbon) and generally is not bioavailable.

For the stock tank surface water samples, total aluminum, copper, iron, lead, and cadmium were correlated. Given the high turbidity of surface water in stock tanks, these constituents are likely related due to their presence in particulate matter. As described above, with the exception of copper, these metals were readily filtered from water samples and pose a limited risk. Copper that passes through the ultra-filtration membrane may be bound to low molecular weight aromatic organic carbon and may not be bioavailable. In general, copper in stock tank surface water poses a low risk.

Results from the first Discriminant Analysis model (Model 1) indicated that copper accounts for the majority of variability in the soil data set (Figure 14). Molybdenum and pH also explained a significant portion of the variability. Copper was excluded from the second DA model to evaluate other relations that were masked by the presence of copper in the first model. For Model 2, the loading of soil pH on Factor 1 explains much of the variance in the

data set (Figure 15). Soil pH is dependent both upon proximity to the former smelter (near smelter samples and some stock tank samples with lower soil pH values) and composition of the native soil (e.g., SW04 soil sample locations with higher soil pH values) (Figure 15). Given the general lack of correlation between soil pH and other constituents, soil pH does not appear to be a good predictor of concentrations of metals in soil for locations that are not in close proximity to the former smelter (~2.5 miles) or are located in areas with alkaline soil (e.g., stock tank sampling locations SW04, SW11, SW12, and SW13).

The loading of arsenic, barium, cadmium, and molybdenum onto Model 2 Factor 2 likely indicate effects of historic smelter emissions on soil concentrations of these constituents. Samples located closest to the former smelter had generally higher concentrations of these and other constituent concentrations (e.g., Sb, Ag) relative to stock tank and upland drainage sampling locations. The separation of upland drainage and stock tank sample locations from the near smelter and SW04 sample locations (Figure 15) likely indicates that stock tank and upland drainage sampling location are not as strongly affected by historic smelter emission compared with near smelter locations.

The loading of manganese, magnesium, aluminum, and cobalt on Model 2 Factor 3 is consistent with the higher concentrations of these constituents in upland drainage soil compared with other sampling locations. Elevated concentrations of copper in upland drainage surface water likely are representative of minor contributions of copper from former smelter emissions. The clear separation of the upland drainage, stock tank, near smelter, and near SW04 sampling locations in the Canonical Scores Plot indicates that soil samples from these different portions of the STSIU have statistically distinct constituent compositions, likely indicating different levels of contributions to soil from former smelter emissions.

Summary

Combined, these results indicate that potential historic smelter emissions contributed to elevated or detected surface water concentrations of total and dissolved copper in the near smelter, stock tank, and upland drainage sampling locations and cadmium and lead in the near smelter and stock tank sampling locations (Table 4, Figures 7–9). Former smelter emissions have also resulted in enriched concentrations of several constituents in STSIU soil. In general, soil concentrations of historic smelter emission constituents decline with increasing distance from the former smelter. This is consistent with the expected transport and distribution of constituents of interest in historical smelter emissions (SRK, 2008).

Historic smelter emissions appear to have had a lesser affect on soil and surface water quality in the upland drainage portion of the STSIU compared with other portions of the STSIU. Concentrations of copper in upland drainage surface water were lower than concentrations of copper in near smelter and stock tank sampling locations. With the exception of metals concentrations in SW05 surface water, elevated concentrations of copper in upland drainage surface water appear to be related to historic smelter emission.

The two levels of filtration (0.45 and 0.001-micron size fractions) were performed to better define the concentrations of metals that are truly biologically available. Metals associated with particulate and colloidal size fractions in surface water are generally not available for

uptake by aquatic biota, and therefore, are not of ecological concern. Concentrations of aluminum, cadmium, copper, and lead in ultra-filtered surface water samples were substantially lower than concentrations in other size fractions and were generally below or close to acute and chronic criteria. Exceptions for the ultrafiltered samples included elevated concentrations of lead and copper in sample SW05 and elevated concentrations of copper in sample CDW-1.

6.0 CONCLUSIONS

Constituents detected in historic smelter emissions include antimony, arsenic, barium, cadmium, chromium, copper, lead, molybdenum, selenium, and silver. Smelter operations were shut down permanently in January 2001 and the stacks were demolished in 2007 (SRK, 2008). Soil samples collected in close proximity to the former smelter (within ~2.5 miles) had concentrations of copper, arsenic, cadmium, cobalt, lead, molybdenum, selenium, silver, and zinc that were elevated with respect to reference soil samples. These constituents were also detected in Chino concentrate and low-grade Chino ore. Concentrations of lead in soil samples collected near the historic smelter had a limited number of samples (5%) with lead concentrations that exceeded reference soil lead concentrations by more than a factor of 1.5. Based on this result, lead is not considered to be a strong "fingerprint" constituent for identifying historic smelter impacts in soil.

Constituents in surface water are derived primarily from interaction of precipitation water with and runoff from soil surfaces. The STSIU drainages are generally ephemeral and intermittent with minimal base flow (i.e., groundwater discharging to surface water). Therefore, the mineral composition of STSIU soil is expected to play an important role in surface water quality. Concentrations of constituents in STSIU soil can be used to discern probable sources of constituents in surface water.

The distributions of metals in STSIU soil samples indicated that most sampling locations had at least some contributions from historic smelter emissions. Of the sample groups evaluated in this Technical Memorandum, contributions of historic smelter emission-related constituents were highest for near smelter sampling locations (including stock tank sampling location SW04), moderate for stock tank sampling locations, and less for upland drainage sampling locations. The distributions of constituent concentrations in STSIU soil samples, and the correlations of constituents in soil were consistent with declining historic smelter emission contributions with increasing distance from the former smelter.

The two levels of filtration (0.45 and 0.001-micron size fractions) were performed to better define the concentrations of metals that may be biologically available. Metals associated with particulate and colloidal size fractions in surface water may not be available for uptake by aquatic biota, and therefore, may not be of ecological concern. Excluding samples SW05 (lead and copper) and CDW-1 (copper), concentrations of aluminum, cadmium, copper, and lead in ultra-filtered surface water samples were substantially lower than other size fractions and were generally below or close to acute and chronic criteria.

7.0 REFERENCES

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TABLES

TABLE 1
SURFACE WATER ANALYTICAL RESULTS - RAINFALL POOLS

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

		Criteria				Near Smelter			Lucky Bill Creek			Rustler Creek			Martin Creek		
Sample ID: Date Collected:	**Units**	**Livestock Watering**	**Wildlife Habitat**	**Aquatic Life Acute[1]**	**Aquatic Life Chronic[1]**	**BD4W-1 2007**	**CDW-1 2007**	**SW04 2007**	**SW01 2007**	**SW02 2007**	**SW03 2007**	**SW05 2007**	**SW09 2007**	**SW10 2007**	**SW06A 2007**	**SW08 2007**	**SW07 2007**
Metals - Total																	
Aluminum	mg/L	--	--	--	--	0.428	0.076	6.80	2.110	0.742	0.384	11.90	0.027	0.013	0.1290	0.0270	0.049
Cadmium	mg/L	--	--	--	--	0.0006	0.0013	<0.001	0.0001	<0.0001	0.00013	0.004	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Copper	mg/L	--	--	--	--	0.0943	0.2390	0.6900	0.0194	0.0140	0.0152	1.16	0.0132	0.0030	0.0278	0.0052	0.0096
Iron	mg/L	--	--	--	--	0.48	0.04	5.23	1.27	0.51	0.38	0.19	0.11	<0.02	0.06	<0.02	<0.02
Lead	mg/L	--	--	--	--	0.0003	<0.0001	0.0096	0.0007	0.0004	0.0011	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese	mg/L	--	--	--	--	0.200	0.0944	0.100	0.0105	0.0343	0.0511	4.64	0.0278	0.0066	0.0037	0.0006	0.00420
Metals-Filtered																	
Aluminum	mg/L	5.00	--	0.75	0.087	0.048	0.052	**0.106**	**0.477**	**0.112**	0.081	***11.20***	0.022	0.007	**0.138**	0.009	0.019
Cadmium	mg/L	0.05	--	0.0009-0.017	0.0008-0.006	0.0006	**0.0013**	<0.0001	<0.0001	<0.0001	<0.0001	0.0038	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/L	--	--	--	--	18.5	10.2	29.4	11.0	16.8	26.0	69.2	27.3	17.6	5.9	24.5	21.9
Copper	mg/L	0.50	--	0.004-0.046	0.003-0.027	***0.080***	***0.2210***	***0.129***	***0.0193***	***0.0139***	***0.0145***	***1.22***	**0.0110**	0.0026	***0.0301***	0.0047	0.0081
Iron	mg/L	--	--	--	--	0.14	<0.02	0.07	0.15	0.09	0.12	0.18	0.08	<0.02	0.05	<0.02	0.030
Lead	mg/L	0.10	--	0.014-0.256	0.0005-0.01	<0.0005	0.0002	0.0002	0.0003	0.0002	0.0005	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium	mg/L	--	--	--	--	5.7	2.4	2.2	4.5	5.1	7.3	46.7	12.3	7.4	2.6	11.6	10.3
Manganese	mg/L	--	--	--	--	0.213	0.0931	0.0024	0.0085	0.0350	0.0501	4.41	0.0328	0.0077	0.0133	0.0007	0.0042
Potassium	mg/L	--	--	--	--	3.6	2.8	9.2	1.9	2.7	3.3	4.1	3.2	2.8	2.1	2.6	3.10
Sodium	mg/L	--	--	--	--	13.9	6.8	0.9	8.4	13.3	18.4	10.3	8.1	7.5	3.9	16.2	13.0
Metals-Ultrafiltered																	
Aluminum	mg/L	5.00	--	0.75	0.087	0.012	0.025	0.005	<0.001	0.003	0.005	***10.00***	0.013	0.009	0.014	0.003	0.016
Cadmium	mg/L	0.05	--	0.0007-0.017	0.0006-0.006	0.0004	**0.0009**	<0.0001	<0.0001	<0.0001	<0.0001	0.0039	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/L	--	--	--	--	16.8	7.8	27.0	9.0	15.3	24.3	69.9	24.8	15.4	4.1	23.2	19.5
Copper	mg/L	0.50	--	0.003-0.046	0.002-0.027	0.0044	***0.1240***	***0.0201***	0.0013	<0.0005	<0.0005	***1.14***	0.0020	0.0009	***0.0030***	<0.0005	0.0022
Iron	mg/L	--	--	--	--	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02
Lead	mg/L	0.10	--	0.01-0.257	0.0004-0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium	mg/L	--	--	--	--	5.1	2.0	2.1	3.8	4.7	7.0	47.0	11.3	6.6	1.9	11.0	9.0
Manganese	mg/L	--	--	--	--	0.207	0.04	<0.0005	0.0025	0.0055	<0.0005	4.28	0.0287	0.0013	<0.0005	<0.0005	<0.0005
Miscellaneous																	
TOC	mg/L	--	--	--	--	3	3	9	11	9	9	8	6	3	13	6	5
DOC - 0.45 μm, ACZ Lab	mg/L	--	--	--	--	3	3	9	12	8	9	8	5	3	13	5	4
DOC - 1.2 μm, CU Lab	mg/L	--	--	--	--	3.28	2.28	8.36	10.82	8.70	8.51	7.98	5.57	3.53	13.16	4.89	4.40
DOC - ultrafiltration	mg/L	--	--	--	--	2.30	1.52	3.85	3.43	4.71	3.36	6.55	3.31	1.75	4.72	2.32	2.87
Alkalinity	mg/L	--	--	--	--	31	<2	86	26	40	58	<2	8	23	5	120	101
Sulfate	mg/L	--	--	--	--	46	47	<1	1	13	32	380	112	51	<1	<1	<1
Chloride	mg/L	--	--	--	--	3	2	2	2	2	3	3	2	2	1	3	3
Nitrate	mg/L	--	--	--	--	<0.02	0	<0.02	<0.02	<0.02	<0.02	1	<0.02	<0.02	<0.02	<0.02	<0.02
Phosphorus	mg/L	--	--	--	--	0.04	<0.01	0.49	0.04	0.02	0.05	0.01	0.01	0.01	0.01	0.06	0.09
Hardness - 0.45 micron	mg/L	--	--	--	--	70	35	83	46	63	95	365	119	74	25	109	97
Hardness - Ultrafiltered	mg/L	--	--	--	--	63	28	76	38	58	89	367	108	66	18	103	86
Charge Imbalance %		--	--	--	--	13.5	4.8	2.7	47.4	26.7	19.1	8.0	5.7	9.1		9.4	10.6
Sum anions	meq/L	--	--	--	--	1.6	1.0	1.8	0.5	1.1	1.9	8.0	2.5	1.5	0.1	2.4	2.1
Sum cations	meq/L	--	--	--	--	2.1	1.1	1.9	1.4	1.9	2.8	9.4	2.8	1.8	0.7	2.9	2.6
Field Parameters																	
pH	Std. units	6.6 - 9[2]	--	--	--	6.39	5.42	9.05	6.47	7.06	7.52	4.17	6.36	6.46	6.74	7.31	7.63
Temperature	°C	--	--	--	--	22.3	17.8	28.8	18.7	19.7	21.6	25.2	18.1	20.7	20.8	21.7	25.2
Dissolved Oxygen	mg/L	>5[2]	--	--	--	4.30	6.91	--	6.05	6.82	6.99	6.34	8.05	6.98	6.32	3.70	5.96
Turbidity	NTU	--	--	--	--	5.1	1.2	404.5	20.2	125.8	4.3	0.6	0.5	0.4	12.1	0.7	1.3
Specific Conductance	μS/cm					221	136	180	140	200	288	825	292	196	79	273	241

Notes:

mg/L - milligrams per liter
μS/cm - micro Siemens per centimeter
meq/L - milliequivalents per liter

TOC - total organic carbon
DOC - dissolved organic carbon
NA - not applicable

NTU - nephelometric turbidity units
-- - no value recorded
°C - celsius

Bolded values indicate concentration exceeds chronic aquatic life criterion
Italicized values indicate concentration exceeds acute aquatic life critrion
Medium-grey highlighted values indicate concentraion exceeds livestock watering criterion
Light gray highlighted cells indicate pH or DO values outside of acceptable range

[1] Ranges of calculated values are shown. Hardness-adjusted chronic and acute aquatic life criteria for cadmium, copper, and lead for individual samples are provided in Table 2.

TABLE 1
SURFACE WATER ANALYTICAL RESULTS - RAINFALL POOLS

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

		Criteria				Stock Tanks					QA/QC Samples			
Sample ID: **Date Collected:**	**Units**	**Livestock Watering**	**Wildlife Habitat**	**Aquatic Life Acute[1]**	**Aquatic Life Chronic[1]**	**SW11 2007**	**SW12 2007**	**SW13 2007**	**SW14 2007**	**SW15 2007**	**SW312 SW12DUP**	**SW313 BD4W-1DUP**	**Blank 2007**	**ER-1 2007**
Metals - Total														
Aluminum	mg/L	--	--	--	--	20.20	10.00	21.80	2.49	4.220	11.50	0.223	0.001	0.04
Cadmium	mg/L	--	--	--	--	0.0004	0.0002	0.0005	0.0003	<0.001	0.0003	0.0006	<0.0001	<0.0001
Copper	mg/L	--	--	--	--	0.2100	0.1880	0.2530	0.0967	0.1100	0.1950	0.0942	0.0012	<0.0005
Iron	mg/L	--	--	--	--	15.50	10.60	17.30	2.59	2.76	10.40	0.56	<0.02	<0.02
Lead	mg/L	--	--	--	--	0.0086	0.0061	0.0105	0.0022	0.0028	0.0064	0.00030	<0.0001	0.0003
Manganese	mg/L	--	--	--	--	0.183	0.1150	0.23	0.30	0.089	0.1270	0.204	0.0006	<0.0005
Metals-Filtered														
Aluminum	mg/L	5.00	--	0.75	0.087	**0.186**	**0.139**	0.075	**0.299**	**0.307**	**0.128**	0.049	0.006	0.02
Cadmium	mg/L	0.05	--	0.0009-0.017	0.0008-0.006	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0006	<0.0001	<0.0001
Calcium	mg/L	--	--	--	--	13.8	18.5	25.5	7.3	14.8	18.3	19.2	<0.2	<0.2
Copper	mg/L	0.50	--	0.004-0.046	0.003-0.027	***0.0397***	***0.0458***	***0.0456***	***0.0487***	***0.0522***	***0.0449***	***0.071***	0.0007	<0.0005
Iron	mg/L	--	--	--	--	0.11	0.17	0.03	0.16	0.17	0.15	0.14	<0.02	<0.02
Lead	mg/L	0.10	--	0.014-0.256	0.0005-0.01	0.0001	0.0003	<0.0001	0.0003	0.0002	0.003	<0.0005	<0.0001	<0.0001
Magnesium	mg/L	--	--	--	--	1.8	1.9	2.6	2.0	4.9	1.9	6.0	<0.2	<0.2
Manganese	mg/L	--	--	--	--	0.0326	0.0265	0.0115	0.0170	0.0027	0.0295	0.216	<0.0005	<0.0005
Potassium	mg/L	--	--	--	--	8.2	9.7	9.1	8.1	6.3	9.6	3.7	<0.3	<0.3
Sodium	mg/L	--	--	--	--	0.7	0.5	0.5	2.3	3.5	0.5	14.5	<0.3	3.4
Metals-Ultrafiltered														
Aluminum	mg/L	5.00	--	0.75	0.087	0.009	0.004	0.002	0.003	0.002	0.007	0.004	0.002	0.042
Cadmium	mg/L	0.05	--	0.0007-0.017	0.0006-0.006	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	0.0003	<0.0001	<0.0001
Calcium	mg/L	--	--	--	--	12.7	17.0	23.6	6.4	12.7	17.1	15.7	<0.2	<0.2
Copper	mg/L	0.50	--	0.003-0.046	0.002-0.027	***0.0073***	0.0046	**0.0081**	***0.0097***	***0.0094***	***0.0148***	0.0024	<0.0005	0.0021
Iron	mg/L	--	--	--	--	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Lead	mg/L	0.10	--	0.01-0.257	0.0004-0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium	mg/L	--	--	--	--	1.7	1.8	2.4	1.8	4.2	1.9	4.9	<0.2	0.2
Manganese	mg/L	--	--	--	--	0.0015	<0.0005	0.0007	0.0014	<0.0005	0.0006	0.200	<0.0005	<0.0005
Miscellaneous														
TOC	mg/L	--	--	--	--	8	11	7	14	8	8	4	<1	<1
DOC - 0.45 μm, ACZ Lab	mg/L	--	--	--	--	6	6	6	11	8	7	4	<1	<1
DOC - 1.2 μm, CU Lab	mg/L	--	--	--	--	5.96	6.50	6.18	11.53	7.54	5.93	3.41	0.33	0.48
DOC - ultrafiltration	mg/L	--	--	--	--	3.25	5.68	3.69	5.11	3.80	3.51	2.73	0.49	0.27
Alkalinity	mg/L	--	--	--	--	42	56	48	22	33	56	32	<2	3
Sulfate	mg/L	--	--	--	--	<1	<1	<1	<1	<1	<1	45	<1	<1
Chloride	mg/L	--	--	--	--	2	2	2	2	2	3	3	<1	3
Nitrate	mg/L	--	--	--	--	1	1	2	0	<0.02	0.65	<0.02	<0.02	<0.02
Phosphorus	mg/L	--	--	--	--	0.62	0.42	0.58	0.20	0.09	0.42	0.03	<0.01	<0.01
Hardness - 0.45 micron	mg/L	--	--	--	--	42	54	74	26	57	54	73	<1	<1
Hardness - Ultrafiltered	mg/L	--	--	--	--	39	50	69	23	49	51	59	<1	<1
Charge Imbalance %		--	--	--	--	15.8	8.3	25.9	33.3	36.4	4	15.8	NA	0.0
Sum anions	meq/L	--	--	--	--	0.8	1.1	1.0	0.4	0.7	1.2	1.6	NA	0.1
Sum cations	meq/L	--	--	--	--	1.1	1.3	1.7	0.8	1.5	1.3	2.2	NA	0.1
Field Parameters														
pH	Std. units	6.6 - 9[2]	--	--	--	7.23	7.30	7.25	9.21	7.93	7.3	6.39	NR	NR
Temperature	°C	--	--	--	--	24.4	23.3	23.6	28.7	28.6	22.3	23.3	NR	NR
Dissolved Oxygen	mg/L	>5[2]	--	--	--	3.90	4.07	3.96	9.84	6.61	4.07	4.30	NR	NR
Turbidity	NTU	--	--	--	--	410.9	223.5	497.1	111.3	91.3	223.5	5.1	NR	NR
Specific Conductance	μS/cm					118	145	202	107	151	145	221	NR	NR

Notes:
mg/L - milligrams per liter
μS/cm - micro Siemens per centimeter
meq/L - milliequivalents per liter
TOC - total organic carbon
DOC - dissolved organic carbon
NA - not applicable
NTU - nephelometric turbidity units
-- - no value recorded
°C - celsius

Bolded values indicate concentration exceeds chronic aquatic life criterion
Italicized values indicate concentration exceeds acute aquatic life critrion
Medium-grey highlighted values indicate concentraion exceeds livestock watering criterion
Light gray highlighted cells indicate pH or DO values outside of acceptable range

[1] Ranges of calculated values are shown. Hardness-adjusted chronic and acute aquatic life criteria for cadmium, copper, and lead for individual samples are provided in Table 2.

TABLE 2
HARDNESS-ADJUSTED ACUTE AND CHRONIC AQUATIC LIFE CRITERIA

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

		Near Smelter			Lucky Bill Creek			Rustler Creek			Martin Creek			Stock tanks					QA/QC Samples	
Sample ID:	**Units**	**BD4W-1**	**CDW-1**	**SW04**	**SW01**	**SW02**	**SW03**	**SW05**	**SW09**	**SW10**	**SW06A**	**SW08**	**SW07**	**SW11**	**SW12**	**SW13**	**SW14**	**SW15**	**SW312**	**SW312**
Hardness - 0.45 micron	mg/L	70	35	83	46	63	95	365	119	74	25	109	97	42	54	74	26	57	54	73
ln Hardness - 0.45 micron		4.2	3.6	4.4	3.8	4.1	4.6	5.9	4.8	4.3	3.2	4.7	4.6	3.7	4.0	4.3	3.3	4.0	4.0	4.3
Acute Criteria - 0.45 micron Hardness																				
Aluminum	mg/L	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Cadmium	mg/L	0.0029	0.0014	0.0035	0.0018	0.0026	0.0040	0.0173	0.0051	0.0031	0.0009	0.0047	0.0041	0.0017	0.0022	0.0031	0.0010	0.0023	0.0022	0.0030
Copper	mg/L	0.0096	0.0050	0.0113	0.0065	0.0087	0.0128	0.0455	0.0158	0.0101	0.0036	0.0146	0.0131	0.0059	0.0075	0.0101	0.0038	0.0079	0.0075	0.0100
Lead	mg/L	0.0437	0.0203	0.0527	0.0275	0.0389	0.0611	0.2556	0.0780	0.0465	0.0139	0.0709	0.0625	0.0248	0.0328	0.0465	0.0145	0.0348	0.0328	0.0458
Chronic Criteria - 0.45 micron Hardness																				
Aluminum	mg/L	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087
Cadmium	mg/L	0.0017	0.0010	0.0019	0.0013	0.0016	0.0022	0.0058	0.0025	0.0018	0.0008	0.0024	0.0022	0.0012	0.0014	0.0018	0.0008	0.0015	0.0014	0.0018
Copper	mg/L	0.0066	0.0037	0.0076	0.0046	0.0060	0.0086	0.0271	0.0104	0.0069	0.0027	0.0096	0.0087	0.0043	0.0053	0.0069	0.0028	0.0055	0.0053	0.0068
Lead	mg/L	0.0017	0.0008	0.0021	0.0011	0.0015	0.0024	0.0100	0.0030	0.0018	0.0005	0.0028	0.0024	0.0010	0.0013	0.0018	0.0006	0.0014	0.0013	0.0018
Hardness - Ultrafiltration	mg/L	63	28	76	38	58	89	367	108	66	18	103	86	39	50	69	23	49	51	40
ln Hardness - Ultrafiltration		4.1	3.3	4.3	3.6	4.1	4.5	5.9	4.7	4.2	2.9	4.6	4.5	3.7	3.9	4.2	3.2	3.9	3.9	3.7
Acute Criteria - Ultrafiltration Hardness																				
Aluminum	mg/L	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Cadmium	mg/L	0.0026	0.0011	0.0032	0.0015	0.0023	0.0038	0.0174	0.0047	0.0027	0.0007	0.0044	0.0036	0.0015	0.0020	0.0028	0.0009	0.0020	0.0020	0.0016
Copper	mg/L	0.0087	0.0040	0.0104	0.0054	0.0080	0.0121	0.0458	0.0145	0.0090	0.0027	0.0138	0.0116	0.0055	0.0070	0.0095	0.0034	0.0069	0.0071	0.0057
Lead	mg/L	0.0389	0.0156	0.0479	0.0223	0.0352	0.0572	0.2574	0.0705	0.0407	0.0096	0.0668	0.0545	0.0227	0.0301	0.0429	0.0129	0.0294	0.0305	0.0236
Chronic Criteria - Ultrafiltration Hardness																				
Aluminum	mg/L	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087
Cadmium	mg/L	0.0016	0.00087	0.0018	0.0011	0.0015	0.0021	0.0058	0.0024	0.0016	0.0006	0.0023	0.0020	0.0011	0.0013	0.0017	0.0008	0.0013	0.0014	0.0011
Copper	mg/L	0.0060	0.0030	0.0071	0.0039	0.0056	0.0081	0.0272	0.0096	0.0062	0.0021	0.0092	0.0078	0.0040	0.0049	0.0065	0.0026	0.0049	0.0050	0.0041
Lead	mg/L	0.0015	0.0006	0.0019	0.0009	0.0014	0.0022	0.0100	0.0027	0.0016	0.0004	0.0026	0.0021	0.0009	0.0012	0.0017	0.0005	0.0011	0.0012	0.0009
Copper Criteria Ratios																				
Dissolved Copper (0.45 micron)	mg/L	0.080	0.2210	0.129	0.0193	0.0139	0.0145	1.22	0.0110	0.0026	0.0301	0.0047	0.0081	0.0397	0.0458	0.0456	0.0487	0.0522	0.0449	0.071
Acute Criterion Ratio*		**8.3**	**44**	**11**	**3.0**	**1.6**	**1.1**	**27**	0.7	0.3	**8.3**	0.3	0.6	**6.7**	**6.1**	**4.5**	**12.9**	6.6	6.0	7.1
Chronic Criterion Ratio**		**12.1**	**61**	**17**	**4.2**	**2.3**	**1.7**	**45**	**1.1**	0.4	**11**	0.5	0.9	**9.3**	**8.7**	**6.6**	**17.2**	9.4	8.5	10.4
Dissolved Copper (ultrafiltered)	mg/L	0.0044	0.1240	0.0201	0.0013	<0.0005	<0.0005	1.14	0.0020	0.0009	0.0030	<0.0005	0.0	0.0073	0.0046	0.0081	0.0097	0.0094	0.0148	0.0024
Acute Criterion Ratio*		0.5	**31**	**1.9**	0.2	--	--	**25**	0.1	0.1	**1.1**	--	0.19	**1.3**	0.7	0.9	**2.8**	1.4	2.1	0.4
Chronic Criterion Ratio**		0.7	**41**	**2.8**	0.3	--	--	**42**	0.2	0.1	**1.4**	--	0.28	**1.8**	0.9	**1.2**	**3.7**	1.9	3.0	0.6

Notes:
mg/L - milligrams per liter
ln - natural logarithm
< - indicates sample concentration less than the laboratory detection limit shown
Bolded values indicatechronic or acute ratio value greater than 1.0
* - acute criterion ratio = measured constituent concentration divided by its respective acute criterion
** - chronic criterion ratio = measured constituent concentration divided by its respective chronic criterion

TABLE 3
DISSOLVED ORGANIC CARBON SELECTIVE ULTRAVIOLET ABSORBANCE

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

	0.45 micron-filter pore size			Ultrafiltration			
Sample	**DOC (mg/L)**	**Absorbance 254 (cm^{-1})**	**SUVA-254 ($LxmgC^{-1x}m^{-1}$)**	**Ultrafiltration Date**	**DOC (mg/L)**	**Absorbance 254 (cm^{-1})**	**SUVA-254 ($LxmgC^{-1x}m^{-1}$)**
BDW-4	3.28	0.14	4.11	12/25/2007	2.30	0.038	1.65
CDW-1	2.28	0.04	1.89	2/12/2008	1.52	0.020	1.32
SW04	8.36	0.39	4.66	11/8/2007	3.85	0.077	1.99
SW01	10.82	0.50	4.64	10/18/2007	3.43	0.057	1.65
SW02	8.70	0.33	3.82	10/25/2007	4.71	0.063	1.34
SW03	8.51	0.30	3.51	10/29/2007	3.36	0.063	1.87
SW05	7.98	0.21	2.67	11/8/2007	6.55	0.116	1.77
SW09	5.57	0.13	2.31	11/11/2007	3.31	0.050	1.51
SW10	3.53	0.07	1.99	11/15/2007	1.75	0.025	1.40
SW06A	13.16	0.45	3.43	12/20/2007	4.72	0.080	1.70
SW08	4.89	0.13	2.74	10/11/2007	2.32	0.033	1.42
SW07	4.40	0.12	2.71	12/29/2007	2.87	0.049	1.71
SW11	5.96	1.16	19.47	12/7/2007	3.25	0.062	1.89
SW12	6.50	0.62	9.47	10/16/2007	5.68	0.066	1.15
SW13	6.18	0.77	12.43	1/3/2008	3.69	0.097	2.62
SW14	11.53	0.48	4.15	12/13/2007	5.11	0.103	2.02
SW15	7.54	0.40	5.33	12/10/2007	3.80	0.077	2.03
SW312	5.93	0.65	10.95	11/29/2007	3.51	0.067	1.90
SW313	3.41	0.14	4.04	1/6/2008	2.73	0.038	1.38
TB-1	0.33	0.00	0.08	12/2/2007	0.49	0.003	0.61
ER-1	0.48	0.00	0.49	2/14/2008	0.27	0.001	0.48

Notes:
mg/L - milligrams per liter
cm - centimeter
m - meter
L - length of light pathway

DOC - disolved organic carbon
Absorbance-254 - UV absorbance at 254 nanometers wavelength
SUVA-25 4- selective UV absorbance at 254 nanometers wavelength

TABLE 4
SUMMARY STATISTICS FOR SURFACE WATER SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

	Upland Drainage Surface Water Sample Concentrations (mg/L)					Stock Tank Surface Water Sample* Concentrations (mg/L)					Near Smelter Surface Water Sample** Concentrations (mg/L)				
Metals - Total	Minimum	Maxi-mum	Mean	Geo-mean	Std. Dev.	Minimum	Maxi-mum	Mean	Geo-mean	Std. Dev.	Minimum	Maxi-mum	Mean	Geo-mean	Std. Dev.
Aluminum	0.013	2.110	0.435	0.117	0.723	2.490	21.800	11.742	8.572	8.915	0.076	6.8	2.435	0.605	3.785
Cadmium	0.0001	0.0001	0.0001	0.0001	0	0.0002	0.001	0.0005	0.0004	0.0003	0.0006	0.0013	0.0010	0.0009	0.0004
Copper	0.003	0.03	0.013	0.011	0.008	0.097	0.25	0.172	0.160	0.067	0.094	0.69	0.341	0.250	0.311
Iron	0.020	1.27	0.299	0.103	0.434	2.590	17.30	9.750	7.271	6.909	0.040	5.23	1.917	0.465	2.878
Lead	0.0001	0.0011	0.0003	0.0002	0.0004	0.0022	0.0105	0.0060	0.0051	0.0036	0.0001	0.0096	0.0033	0.0007	0.0054
Manganese	0.0006	0.0511	0.0174	0.0087	0.0183	0.0890	0.30	0.1834	0.1668	0.0857	0.0944	0.20	0.1315	0.1236	0.0594
Metals-Filtered															
Aluminum	0.007	0.477	0.108	0.045	0.157	0.075	0.307	0.201	0.178	0.101	0.048	0.106	0.069	0.064	0.032
Cadmium	0.0001	0.0001	0.0001	0.0001	0	0.0001	0.0001	0.0001	0.0001	0	0.0001	0.0013	0.0007	0.0004	0.0006
Calcium	5.9	27.3	18.9	17.1	7.5	7.3	25.5	16.0	14.8	6.7	10.2	29.4	19.4	17.7	9.6
Copper	0.0026	0.03	0.0130	0.0103	0.0088	0.0397	0.05	0.0464	0.0462	0.0046	0.0800	0.22	0.1433	0.1316	0.0716
Iron	0.02	0.15	0.07	0.05	0.05	0.03	0.17	0.13	0.11	0.06	0.02	0.14	0.08	0.06	0.06
Lead	0.0001	0.0005	0.0002	0.0002	0.0001	0.0001	0.0003	0.0002	0.0002	0.0001	0.0002	0.0005	0.0003	0.0003	0.0002
Magnesium	2.6	12.3	7.6	6.8	3.5	1.8	4.9	2.6	2.4	1.3	2.2	5.7	3.4	3.1	2.0
Manganese	0.0007	0.05	0.019	0.010	0.018	0.0027	0.03	0.018	0.014	0.012	0.0024	0.21	0.103	0.036	0.106
Potassium	1.9	3.3	2.7	2.7	0.5	6.3	9.7	8.3	8.2	1.3	2.8	9.2	5.2	4.5	3.5
Sodium	3.9	18.4	11.1	10.0	4.9	0.5	3.5	1.5	1.1	1.3	0.9	13.9	7.2	4.4	6.5
Metals-Ultrafiltered															
Aluminum	0.001	0.016	0.008	0.006	0.006	0.002	0.009	0.004	0.003	0.003	0.005	0.025	0.014	0.011	0.010
Cadmium	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0004	0.0002	0.0001	0.0001	0.0001	0.0009	0.0005	0.0003	0.0004
Calcium	4.1	24.8	17.0	14.9	7.5	6.4	23.6	14.5	13.3	6.3	7.8	27.0	17.2	15.2	9.6
Copper	0.0005	0.00	0.0014	0.0011	0.0009	0.0046	0.0097	0.0078	0.0076	0.0020	0.0044	0.124	0.0495	0.0222	0.0650
Iron	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.00
Lead	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0000
Magnesium	1.9	11.3	6.9	6.0	3.4	1.7	4.2	2.4	2.2	1.1	2.0	5.1	3.1	2.8	1.8
Manganese	0.001	0.03	0.01	0.002	0.01	0.001	0.00	0.00	0.001	0.00	0.001	0.21	0.08	0.016	0.11
Miscellaneous															
TOC	3	13	8	7	3	7	14	10	9	3	3	9	5	4	3
DOC - 0.45 μm	3	13	7	7	4	6	11	7	7	2	3	9	5	4	3
DOC - ultrafiltration	1.75	4.72	3.31	3.16	1.04	3.25	5.68	4.31	4.21	1.04	1.52	3.85	2.56	2.38	1.19
Alkalinity	5	120	48	30	43	22	56	40	38	13	2	86	40	17	43
Sulfate	1	112	27	6	39	1	1	1	1	0	1	47	31	13	26
Chloride	1.0	3.0	2.3	2.1	0.7	2.0	2.0	2.0	2.0	0.0	2.0	3.0	2.3	2.3	0.6
Nitrate	0.02	0.02	0.02	0.02	0.00	0.02	1.95	0.66	0.22	0.79	0.02	0.06	0.03	0.03	0.02
Phosphorus	0.01	0.09	0.04	0.03	0.03	0.09	0.62	0.38	0.31	0.23	0.01	0.49	0.18	0.06	0.27
Field Parameters															
pH	6.4	7.6	6.9	6.9	0.5	7.2	9.2	7.8	7.7	0.8	5.4	9.1	7.0	6.8	1.9
Dissolved Oxygen	3.70	8.05	6.36	6.23	1.26	3.90	9.84	5.68	5.28	2.59	4.00	6.91	5.07	4.92	1.60
Turbidity	0.4	125.8	20.7	3.5	43.1	91.3	497.1	266.8	215.4	180.7	1.2	404.5	136.9	13.4	231.7
Specific Conductance	79	292	214	198	76	107	202	145	141	37	136	221	179	176	43

Notes:
mg/L - milligrams per liter
Geomean - geometric mean
Std. Dev. - standard deviation
Std. units - standard units
* - excluding stock tank sampling locaiton SW04
** - including stock tank sampling location SW04

TABLE 5
SUMMARY STATISTICS FOR SOIL SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

	Upland Drainage Soil Sample Concentrations (mg/kg)					Stock Tank Soil Sample* Concentrations (mg/kg)					Near Smelter Soil Sample Concentrations (mg/kg)					Near SW-04 Soil Sample Concentrations (mg/kg)				
	Mini-mum	Maxi-mum	Mean	Geo-mean	Std. Dev.	Mini-mum	Maxi-mum	Mean	Geo-mean	Std. Dev.	Mini-mum	Maxi-mum	Mean	Geo-mean	Std. Dev.	Mini-mum	Maxi-mum	Mean	Geo-mean	Std. Dev.
Al	6190	19900	11403	10532	4714	5800	11200	8508	8306	1894	5860	12600	8947	8656	2436	8890	14100	11738	11620	1722
Sb	0.58	0.58	0.6	0.6	0.0	0.58	0.58	0.6	0.6	0.0	0.76	0.76	0.8	0.8	0.0	0.76	2	1.2	1.0	0.7
As	0.92	2.2	1.7	1.7	0.4	0.76	2.9	2.1	1.9	0.7	0.98	9.4	5.4	4.7	2.4	2.5	6.4	4.1	4.0	1.3
Ba	69.9	228	130	123	47	62.3	142	102	99	26	100	263	203	196	49	126	245	183	180	34
Be	0.48	1.0	0.7	0.6	0.1	0.38	0.74	0.6	0.6	0.1	0.41	0.91	0.6	0.6	0.2	0.64	0.91	0.8	0.8	0.1
B	1.7	1.7	1.7	1.7	0.0	1.7	1.7	1.7	1.7	0.0	1.5	1.5	1.5	1.5	0.0	1.5	3.8	2.4	2.3	0.9
Cd	0.13	2.6	0.5	0.4	0.6	0.08	0.69	0.4	0.4	0.2	0.65	3.0	1.7	1.5	0.8	1.6	6.7	3.3	3.0	1.7
Ca	1200	6760	3942	3585	1641	997	33800	9177	3578	12606	1150	15000	3578	2343	4451	3340	33900	16445	13620	9338
Cr	5.2	99	31	18	33	7.3	32.8	17.0	15.2	8.2	4.4	11.8	7.7	7.5	2.2	12.8	15.9	14.3	14.2	1.1
Co	5.4	27.8	13.0	11.0	8.0	4.6	16.4	9.0	8.1	4.3	3.9	10.8	8.1	7.7	2.4	9.4	13.1	10.9	10.9	1.3
Cu	92.5	449	211	194	93	119	740	492	431	223	908	4280	2795	2565	1080	3160	6670	4673	4549	1151
Fe	9460	55000	22726	19601	13290	10600	46500	25460	23169	11353	7170	24500	18063	17168	5131	16500	21000	18860	18798	1597
Pb	8.8	275	34.6	19.0	69.3	8.4	24.2	17.4	16.6	5.1	14.3	86.4	61.6	55.6	22.4	40.3	130	72.4	68.4	27.5
Mg	1340	7680	3509	3053	1880	1030	3720	2234	2010	1027	1300	5360	2303	2053	1323	1980	3540	2976	2937	484
Mn	245	763	526	502	153	118	422	280	264	94	125	417	229	213	95	327	464	386	383	45
Hg	0.02	0.03	0.02	0.02	0.00	0.02	0.04	0.02	0.02	0.01	0.06	0.17	0.10	0.10	0.03	0.05	0.11	0.08	0.08	0.02
Mo	1.7	7.6	4.0	3.6	1.8	1.6	15.5	8.5	7.3	4.4	6.6	70.6	40.3	33.1	21.6	9.2	23	15.1	14.4	4.9
Ni	3.4	58.5	20.4	13.0	19.4	4.2	15.5	9.8	8.5	4.9	4.9	19.9	11.4	10.3	5.3	13.2	19.4	16.2	16.1	1.8
K	1170	2270	1782	1758	296	1160	2580	1890	1822	523	1340	3270	1941	1859	640	2020	3740	2799	2755	525
Se	0.04	0.44	0.18	0.15	0.11	0.12	1.10	0.60	0.50	0.35	0.80	3.70	2.09	1.92	0.88	0.18	0.80	0.53	0.46	0.28
Ag	0.07	0.33	0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.00	0.12	2.00	0.86	0.59	0.68	0.93	1.60	1.26	1.23	0.27
Na	61	665	178	139	157	37	98	66	64	18	79	245	174	163	58	58	103	80	79	13
Tl	0.35	0.57	0.39	0.39	0.07	0.35	0.63	0.38	0.37	0.09	0.74	1.20	0.79	0.78	0.15	0.74	0.74	0.74	0.74	0.00
V	15.9	210	62	42	58	18	68.5	35.3	32.7	15.0	10.7	26.9	17.5	17.1	4.4	23.1	30.1	26.9	26.8	2.5
Zn	20	1010	116	54	258	18.5	64.8	37.3	33.9	16.6	28.6	221	108.3	94.5	56.0	83.2	411	163	138	114
pH	5.62	7.18	6.46	6.44	0.55	4.24	8.16	5.87	5.68	1.61	4.40	7.67	5.01	4.93	1.05	6.72	7.92	7.72	7.71	0.36

Notes:
mg/kg - milligrams per kilogram
Geomean - geometric mean
Std. Dev. - standard deviation
Upland drainage soil samples - SS99, SS100, SS102, SS108, SS113, SS114, SS119S, SS120, SS123, ERA162, ERA163, ERA164, ERA165
Stock tank soil samples - SS122, SS125S, SS129S, SS130, SS131S, SS132, SS139, SS143, SS149, SS150
Near smelter soil samples - S35, S36, S37, S38, S39, S40, S43, S44, S48
Near SW-04 soil samples - S6, S11, S12, S13, S17, S18, S19, S20, S21, S22
* - excluding stock tank sampling location SW04

TABLE 6
COMPARISON OF STACK EMISSION, ORE, CONCENTRATE, AND SOIL SAMPLES TO REFERENCE SOIL SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

	Constituents Associated with Stack Emissions[1]	Sample Concentrations Compared with Reference Soil Concentrations[9, 10]						
		Concentrate[2]	Low Grade Ore[3]	STSIU Soils Near Former Smelter Soil[4]	Near Smelter Soil[5]	Near SW04 Soil[6]	Stock Tanks Soil[7]	Upland Drainages Soil[8]
Antimony	Yes	Higher 6x	Higher 100x	Same	Same	Same	Same	Same
Arsenic	Yes	Higher 10x	Same	Higher 5x	Same	Same	Same	Same
Barium	Yes	--	Same	Same	Same	Same	Same	Same
Cadmium	Yes	Higher 60x	Higher 3.5x	Higher 2.5x	Same	Slightly Higher 2x	Same	Same
Chromium	Yes	Same	Higher 3.5x	Same	Same	Same	Same	Same* 2.5x
Cobalt	No	Higher 14x	--	Higher 5x	Same	Same	Same	Same
Copper	Yes	Higher 1,000x	Higher 12x	Higher 100x	Higher 15x	Higher 20x	Higher 2.5x	Same
Lead	Yes	Higher 5x	Slightly Higher 1.6x	Slightly Higher 3x***	Same	Same	Same	Same* 3x
Molybdenum	Yes	--	Higher 10x	Higher 10x	Higher 3x	Same	Same	Same
Nickel	No	Higher 2.5x	Same	Same	Same	Same	Same	Same
Selenium	Yes	Higher 20x	Same	Higher 8x	Higher 3x	Same	Same	Same
Silver**	Yes	Same	--	Higher 40x	Higher 10x	Higher 8x	Same	Same* 1.7x
Zinc	No	--	Higher 1.5x	Higher 2.5x	Same	Higher 2x	same	Same* 5x

Notes:

-- - no data

6x - indicates relative difference in maximum sample concentrations compared with maximum reference soil concentration

* - limited number of samples (1 or 2) with constituent concentrations more than 1.5x greater than reference sample concentrations

** - silver not detected in reference soil samples, relative difference between reference soils based on detection limit

*** - limited number of samples (5%) with lead concentrations that exceeded reference soil lead concentrations by more than 1.5x

[1] - constituents associated with stack emissions from Table 6.3-1 Background Report (Chino, 1995)

[2] - assay results for smelter concentrate from Table 6.3-3 Background Report (Chino, 1995)

[3] - constituent concentrations for low grade ore from Table 6.3-1 Background Report (Chino, 1995)

[4] - soil samples located close to former smelter (SRK, 2008), sample data not used in statistical evaluation for Rainfall Pool study

[5] - upland drainage soil samples - SS99, SS100, SS102, SS108, SS113, SS114, SS119S, SS120, SS123, ERA162, ERA163, ERA164, ERA165

[6] - stock tank soil samples - SS122, SS125S, SS129S, SS130, SS131S, SS132, SS139, SS143, SS149, SS150

[7] - near smelter soil samples - S35, S36, S37, S38, S39, S40, S43, S44, S48

[8] - near SW-04 soil samples - S6, S11, S12, S13, S17, S18, S19, S20, S21, S22

[9] - reference soil sample constituent concentrations from Table 4-6 STSIU RI Report (SRK, 2008)

[10] - concentrations are considered to be same as reference soil sample concentrations unless elevated by a factor of 1.5 or greater

TABLE 7
CORRELATION MATRICES FOR SURFACE WATER SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

UPLAND DRAINAGE SURFACE WATER SAMPLES*

	T-Al	*T-Cd*	*T-Cu*	*T-Fe*	*T-Pb*	*T-Mn*	*F-Al*	*F-Ca*	*F-Cu*	*F-Fe*	*F-Pb*	*F-Mg*	*F-Mn*	*F-K*	*F-Na*	*U-Al*	*U-Ca*	*U-Cu*	*U-Mg*	*U-Mn*	*TOC*	*F-DOC*	*U-DOC*	*Alk*	*SO4*	*Cl*	*P*	*pH*	*DO*	*Turb*	*SC*
T-Al	1.00																														
T-Cd	-0.03	1.00																													
T-Cu	0.38	0.09	1.00																												
T-Fe	0.99	0.08	0.37	1.00																											
T-Pb	0.55	0.82	0.26	0.63	1.00																										
T-Mn	0.09	0.75	0.13	0.22	0.72	1.00																									
F-Al	0.96	-0.07	0.55	0.93	0.47	-0.04	1.00																								
F-Ca	-0.43	0.38	-0.64	-0.35	0.09	0.42	-0.59	1.00																							
F-Cu	0.36	0.07	0.99	0.35	0.24	0.07	0.55	-0.71	1.00																						
F-Fe	0.80	0.42	0.51	0.87	0.81	0.61	0.76	-0.12	0.46	1.00																					
F-Pb	0.47	0.87	0.24	0.56	1.00	0.74	0.39	0.14	0.22	0.77	1.00																				
F-Mg	-0.50	-0.04	-0.69	-0.47	-0.32	-0.03	-0.60	0.88	-0.75	-0.39	-0.28	1.00																			
F-Mn	0.00	0.70	0.24	0.13	0.62	0.98	-0.09	0.35	0.19	0.55	0.65	-0.08	1.00																		
F-K	-0.60	0.47	-0.51	-0.51	0.07	0.53	-0.73	0.86	-0.57	-0.19	0.14	0.67	0.51	1.00																	
F-Na	-0.08	0.60	-0.43	-0.02	0.49	0.47	-0.27	0.68	-0.45	0.09	0.52	0.40	0.34	0.53	1.00																
U-Al	-0.63	-0.21	0.11	-0.66	-0.57	-0.27	-0.49	0.01	0.09	-0.51	-0.53	0.21	-0.14	0.32	-0.43	1.00															
U-Ca	-0.43	0.40	-0.64	-0.35	0.11	0.43	-0.59	1.00	-0.70	-0.12	0.15	0.87	0.35	0.85	0.71	-0.03	1.00														
U-Cu	-0.18	-0.37	0.57	-0.24	-0.46	-0.42	0.05	-0.43	0.55	-0.18	-0.46	-0.16	-0.27	-0.23	-0.70	0.81	-0.46	1.00													
U-Mg	-0.50	0.01	-0.70	-0.46	-0.27	0.02	-0.60	0.90	-0.75	-0.36	-0.23	1.00	-0.03	0.68	0.46	0.15	0.90	-0.22	1.00												
U-Mn	-0.14	-0.19	0.00	-0.09	-0.23	0.29	-0.16	0.41	-0.08	0.15	-0.23	0.47	0.36	0.35	-0.24	0.26	0.38	0.20	0.46	1.00											
TOC	0.51	0.15	0.94	0.51	0.41	0.16	0.65	-0.65	0.95	0.59	0.38	-0.75	0.23	-0.62	-0.23	-0.21	-0.63	0.30	-0.74	-0.18	1.00										
F-DOC	0.59	0.18	0.92	0.59	0.46	0.13	0.73	-0.69	0.93	0.63	0.43	-0.80	0.19	-0.67	-0.28	-0.25	-0.68	0.27	-0.79	-0.23	0.98	1.00									
U-DOC	0.27	0.02	0.83	0.29	0.20	0.33	0.34	-0.49	0.83	0.45	0.17	-0.62	0.44	-0.31	-0.20	0.01	-0.47	0.33	-0.61	0.09	0.82	0.74	1.00								
Alk	-0.23	0.10	-0.54	-0.25	-0.04	-0.20	-0.33	0.48	-0.53	-0.38	-0.02	0.52	-0.32	0.27	0.75	-0.15	0.50	-0.36	0.53	-0.42	-0.38	-0.43	-0.42	1.00							
SO4	-0.32	0.06	-0.22	-0.25	-0.13	0.37	-0.36	0.52	-0.29	0.03	-0.11	0.48	0.43	0.55	-0.19	0.29	0.49	0.04	0.48	0.87	-0.41	-0.41	-0.21	-0.46	1.00						
Cl	-0.15	0.43	-0.63	-0.11	0.28	0.19	-0.32	0.77	-0.66	-0.08	0.31	0.65	0.04	0.59	0.88	-0.21	0.78	-0.54	0.67	-0.19	-0.52	-0.53	-0.54	0.85	-0.10	1.00					
P	0.00	0.19	-0.29	-0.02	0.14	-0.15	-0.06	0.36	-0.31	-0.11	0.15	0.39	-0.28	0.24	0.64	0.01	0.36	-0.11	0.37	-0.42	-0.22	-0.23	-0.30	0.87	-0.50	0.81	1.00				
pH	-0.27	0.46	-0.18	-0.25	0.24	0.18	-0.35	0.38	-0.18	-0.18	0.29	0.22	0.10	0.42	0.80	0.00	0.40	-0.24	0.23	-0.50	-0.08	-0.15	-0.02	0.81	-0.50	0.73	0.80	1.00			
DO	-0.02	0.20	0.22	0.06	0.17	0.57	-0.03	0.06	0.17	0.35	0.18	-0.13	0.64	0.37	-0.34	0.33	0.02	0.21	-0.14	0.58	0.00	0.02	0.26	-0.75	0.70	-0.38	-0.56	-0.44	1.00		
Turb	0.31	-0.15	0.15	0.33	0.13	0.35	0.17	-0.23	0.16	0.27	0.09	-0.41	0.34	-0.15	0.11	-0.40	-0.21	-0.33	-0.39	-0.02	0.28	0.21	0.62	-0.14	-0.21	-0.22	-0.25	0.04	0.14	1.00	
SC	-0.39	0.40	-0.64	-0.31	0.13	0.44	-0.56	1.00	-0.70	-0.08	0.18	0.86	0.36	0.85	0.72	-0.05	1.00	-0.48	0.89	0.38	-0.63	-0.67	-0.47	0.50	0.48	0.79	0.37	0.40	0.03	-0.19	1.00

- Yellow highlighted cells indicate moderatley stron correlation
- Orange highlighted cells indicate strong correlation

* - outlier sample SW-05 removed for correlations

TABLE 7
CORRELATION MATRICES FOR SURFACE WATER SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

STOCK TANK SURFACE WATER SAMPLES*

	T-Al	*T-Cd*	*T-Cu*	*T-Fe*	*T-Pb*	*T-Mn*	*F-Al*	*F-Ca*	*F-Cu*	*F-Fe*	*F-Pb*	*F-Mg*	*F-Mn*	*F-K*	*F-Na*	*U-Al*	*U-Cd*	*U-Ca*	*U-Cu*	*U-Mg*	*U-Mn*	*TOC*	*F-DOC*	*U-DOC*	*Alk*	*NO3*	*P*	*pH*	*DO*	*Turb*	*SC*
T-Al	1.00																														
T-Cd	-0.20	1.00																													
T-Cu	0.96	-0.30	1.00																												
T-Fe	0.98	-0.34	0.99	1.00																											
T-Pb	0.99	-0.25	0.99	0.99	1.00																										
T-Mn	0.07	-0.47	-0.01	0.05	0.05	1.00																									
F-Al	-0.83	0.43	-0.96	-0.91	-0.91	-0.01	1.00																								
F-Ca	0.68	0.07	0.82	0.71	0.77	-0.27	-0.85	1.00																							
F-Cu	-0.78	0.57	-0.70	-0.80	-0.73	-0.17	0.58	-0.17	1.00																						
F-Fe	-0.85	0.05	-0.81	-0.80	-0.85	-0.37	0.72	-0.69	0.44	1.00																					
F-Pb	-0.83	-0.32	-0.67	-0.71	-0.75	0.01	0.44	-0.51	0.50	0.79	1.00																				
F-Mg	-0.37	0.96	-0.40	-0.47	-0.39	-0.54	0.46	0.07	0.74	0.20	-0.10	1.00																			
F-Mn	0.40	-0.78	0.38	0.48	0.37	0.11	-0.34	-0.14	-0.86	0.02	-0.01	-0.85	1.00																		
F-K	0.47	-0.85	0.65	0.62	0.57	0.24	-0.80	0.45	-0.54	-0.35	0.10	-0.80	0.59	1.00																	
F-Na	-0.78	0.73	-0.87	-0.88	-0.83	-0.16	0.90	-0.54	0.81	0.55	0.30	0.78	-0.70	-0.90	1.00																
U-Al	0.45	-0.36	0.29	0.43	0.34	-0.02	-0.11	-0.24	-0.85	-0.01	-0.34	-0.53	0.85	0.14	-0.43	1.00															
U-Cd	-0.47	0.93	-0.52	-0.57	-0.50	-0.62	0.59	-0.10	0.70	0.39	0.00	0.97	-0.72	-0.86	0.83	-0.38	1.00														
U-Ca	0.71	0.02	0.85	0.75	0.80	-0.24	-0.88	1.00	-0.22	-0.71	-0.51	0.01	-0.09	0.49	-0.59	-0.21	-0.16	1.00													
U-Cu	-0.35	0.56	-0.53	-0.50	-0.43	0.43	0.63	-0.41	0.50	-0.05	-0.13	0.49	-0.65	-0.74	0.73	-0.34	0.43	-0.44	1.00												
U-Mg	-0.34	0.97	-0.37	-0.44	-0.35	-0.55	0.42	0.11	0.73	0.17	-0.12	1.00	-0.84	-0.78	0.75	-0.53	0.96	0.05	0.46	1.00											
U-Mn	0.12	-0.39	-0.10	0.06	0.00	0.68	0.24	-0.62	-0.53	-0.07	-0.15	-0.56	0.53	-0.03	-0.11	0.64	-0.48	-0.58	0.30	-0.58	1.00										
TOC	-0.69	-0.54	-0.63	-0.60	-0.66	0.45	0.45	-0.70	0.24	0.60	0.87	-0.40	0.19	0.16	0.18	-0.12	-0.31	-0.68	0.06	-0.43	0.32	1.00									
F-DOC	-0.78	0.05	-0.85	-0.82	-0.82	0.53	0.79	-0.78	0.57	0.46	0.57	0.12	-0.35	-0.43	0.68	-0.35	0.15	-0.79	0.70	0.08	0.36	0.74	1.00								
U-DOC	-0.57	-0.56	-0.35	-0.41	-0.46	0.05	0.08	-0.23	0.30	0.57	0.93	-0.33	0.15	0.45	-0.05	-0.32	-0.27	-0.22	-0.39	-0.34	-0.22	0.80	0.33	1.00							
Alk	0.61	-0.30	0.79	0.72	0.70	-0.48	-0.85	0.78	-0.46	-0.32	-0.23	-0.26	0.38	0.68	-0.76	0.17	-0.30	0.80	-0.88	-0.23	-0.50	-0.46	-0.91	0.07	1.00						
NO3	0.85	-0.19	0.92	0.87	0.91	0.18	-0.92	0.88	-0.44	-0.92	-0.62	-0.27	0.06	0.59	-0.72	-0.06	-0.46	0.90	-0.28	-0.23	-0.19	-0.57	-0.65	-0.32	0.62	1.00					
P	0.94	-0.50	0.93	0.97	0.94	0.16	-0.85	0.55	-0.91	-0.72	-0.62	-0.64	0.65	0.67	-0.92	0.58	-0.70	0.59	-0.52	-0.62	0.25	-0.44	-0.73	-0.33	0.65	0.77	1.00				
pH	-0.78	-0.01	-0.83	-0.80	-0.80	0.55	0.76	-0.78	0.55	0.46	0.60	0.06	-0.31	-0.37	0.63	-0.35	0.10	-0.78	0.66	0.02	0.37	0.78	1.00	0.38	-0.89	-0.63	-0.71	1.00			
DO	-0.81	0.09	-0.87	-0.85	-0.84	0.48	0.81	-0.78	0.61	0.49	0.58	0.16	-0.38	-0.46	0.71	-0.38	0.20	-0.79	0.70	0.13	0.32	0.73	1.00	0.34	-0.91	-0.67	-0.77	0.99	1.00		
Turb	0.99	-0.26	0.96	0.98	0.98	0.19	-0.85	0.69	-0.75	-0.90	-0.79	-0.42	0.36	0.53	-0.80	0.36	-0.54	0.72	-0.30	-0.39	0.14	-0.62	-0.71	-0.52	0.57	0.90	0.94	-0.70	-0.74	1.00	
SC	0.49	0.29	0.62	0.49	0.59	-0.18	-0.66	0.94	0.12	-0.68	-0.46	0.30	-0.47	0.23	-0.27	-0.52	0.10	0.92	-0.11	0.34	-0.67	-0.66	-0.54	-0.26	0.54	0.80	0.29	-0.55	-0.53	0.53	1.00

- Yellow highlighted cells indicate moderatley stron correlation
- Orange highlighted cells indicate strong correlation

* - excluding stock tank sampling location SW04

TABLE 7
CORRELATION MATRICES FOR SURFACE WATER SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

NEAR SMELTER SURFACE WATER SAMPLES**

	T-Al	*T-Cd*	*T-Cu*	*T-Fe*	*T-Pb*	*T-Mn*	*F-Al*	*F-Cd*	*F-Ca*	*F-Cu*	*F-Fe*	*F-Pb*	*F-Mg*	*F-Mn*	*F-K*	*F-Na*	*U-Al*	*U-Cd*	*U-Ca*	*U-Cu*	*U-Mg*	*U-Mn*	*TOC*	*F-DOC*	*U-DOC*	*Alk*	*SO4*	*Cl*	*P*	*pH*	*DO*	*Turb*	*SC*
T-Al	1.00																																
T-Cd	0.04	1.00																															
T-Cu	0.96	0.31	1.00																														
T-Fe	1.00	0.01	0.95	1.00																													
T-Pb	1.00	0.06	0.97	1.00	1.00																												
T-Mn	-0.42	-0.92	-0.65	-0.39	-0.44	1.00																											
F-Al	0.99	0.14	0.99	0.99	1.00	-0.51	1.00																										
F-Cd	-0.84	0.51	-0.66	-0.86	-0.82	-0.14	-0.78	1.00																									
F-Ca	0.92	-0.36	0.78	0.93	0.91	-0.03	0.87	-0.98	1.00																								
F-Cu	-0.22	0.97	0.06	-0.25	-0.19	-0.80	-0.11	0.71	-0.58	1.00																							
F-Fe	-0.05	-1.00	-0.32	-0.02	-0.08	0.93	-0.16	-0.50	0.34	-0.96	1.00																						
F-Pb	-0.46	-0.90	-0.69	-0.43	-0.48	1.00	-0.55	-0.10	-0.08	-0.77	0.91	1.00																					
F-Mg	-0.50	-0.88	-0.72	-0.48	-0.53	1.00	-0.59	-0.05	-0.13	-0.73	0.89	1.00	1.00																				
F-Mn	-0.80	-0.63	-0.93	-0.78	-0.81	0.88	-0.86	0.34	-0.50	-0.42	0.64	0.90	0.92	1.00																			
F-K	1.00	-0.03	0.94	1.00	1.00	-0.35	0.98	-0.88	0.95	-0.29	0.02	-0.40	-0.44	-0.75	1.00																		
F-Na	-0.81	-0.61	-0.94	-0.79	-0.83	0.87	-0.87	0.37	-0.52	-0.39	0.62	0.89	0.91	1.00	-0.77	1.00																	
U-Al	-0.80	0.58	-0.60	-0.81	-0.78	-0.22	-0.73	1.00	-0.97	0.76	-0.56	-0.17	-0.12	0.27	-0.84	0.29	1.00																
U-Cd	-0.81	0.55	-0.62	-0.83	-0.80	-0.19	-0.75	1.00	-0.98	0.75	-0.54	-0.14	-0.09	0.30	-0.85	0.32	1.00	1.00															
U-Ca	0.90	-0.39	0.75	0.92	0.89	0.01	0.85	-0.99	1.00	-0.61	0.38	-0.04	-0.09	-0.46	0.93	-0.49	-0.98	-0.98	1.00														
U-Cu	-0.43	0.88	-0.17	-0.46	-0.41	-0.64	-0.33	0.85	-0.75	0.97	-0.88	-0.60	-0.56	-0.20	-0.49	-0.17	0.89	0.88	-0.78	1.00													
U-Mg	-0.43	-0.92	-0.67	-0.41	-0.46	1.00	-0.53	-0.12	-0.05	-0.78	0.92	1.00	1.00	0.89	-0.37	0.88	-0.20	-0.17	-0.01	-0.62	1.00												
U-Mn	-0.60	-0.82	-0.80	-0.57	-0.62	0.98	-0.68	0.07	-0.24	-0.65	0.83	0.99	0.99	0.96	-0.54	0.95	-0.01	0.02	-0.20	-0.46	0.98	1.00											
TOC	1.00	0.08	0.97	1.00	1.00	-0.46	1.00	-0.81	0.90	-0.17	-0.10	-0.50	-0.54	-0.82	0.99	-0.84	-0.77	-0.79	0.88	-0.39	-0.48	-0.63	1.00										
F-DOC	1.00	0.08	0.97	1.00	1.00	-0.46	1.00	-0.81	0.90	-0.17	-0.10	-0.50	-0.54	-0.82	0.99	-0.84	-0.77	-0.79	0.88	-0.39	-0.48	-0.63	1.00	1.00									
U-DOC	0.96	-0.25	0.84	0.97	0.95	-0.14	0.92	-0.96	0.99	-0.49	0.24	-0.19	-0.24	-0.59	0.98	-0.61	-0.94	-0.95	0.99	-0.67	-0.16	-0.35	0.94	0.94	1.00								
Alk	0.96	-0.26	0.84	0.96	0.95	-0.13	0.92	-0.96	1.00	-0.50	0.25	-0.18	-0.23	-0.58	0.97	-0.60	-0.94	-0.95	0.99	-0.68	-0.15	-0.33	0.94	0.94	1.00	1.00							
SO4	-1.00	-0.06	-0.97	-1.00	-1.00	0.44	-1.00	0.83	-0.91	0.19	0.08	0.48	0.53	0.81	-1.00	0.83	0.78	0.80	-0.89	0.41	0.46	0.62	-1.00	-1.00	-0.95	-0.95	1.00						
Cl	-0.46	-0.90	-0.69	-0.43	-0.48	1.00	-0.55	-0.10	-0.08	-0.77	0.91	1.00	1.00	0.90	-0.40	0.89	-0.17	-0.14	-0.04	-0.60	1.00	0.99	-0.50	-0.50	-0.19	-0.18	0.48	1.00					
P	1.00	0.03	0.96	1.00	1.00	-0.41	0.99	-0.85	0.93	-0.23	-0.04	-0.45	-0.50	-0.79	1.00	-0.81	-0.80	-0.82	0.91	-0.44	-0.43	-0.59	1.00	1.00	0.96	0.96	-1.00	-0.45	1.00				
pH	0.98	-0.18	0.88	0.98	0.97	-0.21	0.95	-0.94	0.98	-0.42	0.16	-0.26	-0.31	-0.65	0.99	-0.67	-0.91	-0.92	0.97	-0.62	-0.23	-0.41	0.97	0.97	1.00	1.00	-0.97	-0.26	0.98	1.00			
DO	-0.62	0.77	-0.37	-0.64	-0.59	-0.46	-0.53	0.94	-0.87	0.90	-0.76	-0.42	-0.37	0.01	-0.67	0.04	0.97	0.96	-0.89	0.98	-0.44	-0.26	-0.58	-0.58	-0.81	-0.82	0.59	-0.42	-0.62	-0.77	1.00		
Turb	1.00	0.07	0.97	1.00	1.00	-0.45	1.00	-0.82	0.91	-0.18	-0.09	-0.49	-0.54	-0.82	0.99	-0.83	-0.77	-0.79	0.89	-0.40	-0.47	-0.63	1.00	1.00	0.95	0.94	-1.00	-0.49	1.00	0.97	-0.59	1.00	
SC	0.07	-0.99	-0.21	0.10	0.04	0.88	-0.04	-0.60	0.45	-0.99	0.99	0.86	0.83	0.55	0.13	0.53	-0.66	-0.63	0.49	-0.93	0.87	0.76	0.02	0.02	0.35	0.36	-0.04	0.86	0.08	0.28	-0.83	0.03	1.00

- Yellow highlighted cells indicate moderatley stron correlation
- Orange highlighted cells indicate strong correlation

** - including stock tank sampling location SW04

TABLE 8
CORRELATION MATRICES FOR SOIL SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

UPLAND DRAINAGE SOIL SAMPLES

	Al	*Sb*	*As*	*Ba*	*Be*	*B*	*Cd*	*Ca*	*Cr*	*Co*	*Cu*	*Fe*	*Pb*	*Mg*	*Mn*	*Hg*	*Mo*	*Ni*	*K*	*Se*	*Ag*	*Na*	*Tl*	*V*	*Zn*	*pH*
Al	1.00																									
Sb	--	1.00																								
As	0.36	--	1.00																							
Ba	0.73	--	0.45	1.00																						
Be	0.06	--	0.19	-0.07	1.00																					
B	0.00	--	0.00	0.00	0.00	1.00																				
Cd	-0.26	--	0.17	-0.14	-0.23	0.00	1.00																			
Ca	0.89	--	0.41	0.79	0.01	0.00	-0.07	1.00																		
Cr	0.77	--	0.49	0.77	-0.19	0.00	-0.19	0.70	1.00																	
Co	0.89	--	0.40	0.78	-0.17	0.00	-0.17	0.83	0.94	1.00																
Cu	0.10	--	0.21	0.00	0.02	0.00	0.17	0.08	-0.16	-0.13	1.00															
Fe	0.88	--	0.44	0.68	-0.25	0.00	-0.11	0.79	0.91	0.96	-0.07	1.00														
Pb	-0.33	--	0.12	-0.18	-0.27	0.00	0.98	-0.17	-0.21	-0.21	0.06	-0.15	1.00													
Mg	0.95	--	0.41	0.65	0.00	0.00	-0.23	0.85	0.75	0.86	0.15	0.91	-0.30	1.00												
Mn	0.55	--	0.22	0.56	-0.10	0.00	0.34	0.75	0.54	0.69	-0.22	0.61	0.28	0.51	1.00											
Hg	0.32	--	0.13	0.05	-0.36	0.00	0.60	0.38	0.27	0.41	0.08	0.48	0.53	0.33	0.63	1.00										
Mo	-0.26	--	-0.14	0.04	-0.40	0.00	-0.02	-0.21	-0.15	-0.23	0.56	-0.18	-0.03	-0.20	-0.35	-0.16	1.00									
Ni	0.85	--	0.34	0.54	-0.11	0.00	-0.22	0.72	0.82	0.90	-0.19	0.93	-0.23	0.89	0.57	0.34	-0.39	1.00								
K	0.40	--	0.40	0.40	0.07	0.00	-0.15	0.41	0.14	0.19	0.28	0.27	-0.16	0.42	0.05	-0.17	0.21	0.26	1.00							
Se	0.30	--	0.45	0.30	-0.47	0.00	0.01	0.41	0.52	0.43	0.06	0.57	-0.02	0.50	0.23	0.25	0.08	0.48	0.18	1.00						
Ag	-0.32	--	0.12	-0.19	-0.25	0.00	0.98	-0.16	-0.20	-0.20	0.02	-0.14	1.00	-0.29	0.29	0.53	-0.10	-0.21	-0.18	-0.02	1.00					
Na	0.80	--	0.37	0.44	-0.16	0.00	-0.14	0.72	0.68	0.77	0.12	0.87	-0.22	0.87	0.45	0.58	-0.11	0.75	0.25	0.59	-0.21	1.00				
Tl	0.03	--	0.09	0.05	0.60	0.00	-0.11	0.11	-0.27	-0.22	0.27	-0.22	-0.18	0.07	-0.13	-0.33	-0.06	-0.19	0.08	-0.19	-0.18	-0.12	1.00			
V	0.86	--	0.44	0.67	-0.22	0.00	-0.18	0.77	0.94	0.96	-0.14	0.99	-0.21	0.87	0.58	0.43	-0.21	0.91	0.21	0.59	-0.21	0.87	-0.25	1.00		
Zn	-0.27	--	0.15	-0.14	-0.28	0.00	0.98	-0.11	-0.14	-0.14	0.02	-0.07	1.00	-0.24	0.34	0.57	-0.08	-0.16	-0.16	0.03	1.00	-0.15	-0.20	-0.14	1.00	
pH	0.32	--	-0.13	0.19	-0.29	0.00	0.02	0.52	0.17	0.32	-0.23	0.37	0.01	0.40	0.55	0.22	-0.20	0.50	0.34	0.38	0.02	0.28	-0.02	0.32	0.04	1.00

- Yellow highlighted cells indicate moderatley stron correlation
- Orange highlighted cells indicate strong correlation

TABLE 8
CORRELATION MATRICES FOR SOIL SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

STOCK TANK SOIL SAMPLES*

	Al	*Sb*	*As*	*Ba*	*Be*	*B*	*Cd*	*Ca*	*Cr*	*Co*	*Cu*	*Fe*	*Pb*	*Mg*	*Mn*	*Hg*	*Mo*	*Ni*	*K*	*Se*	*Ag*	*Na*	*Tl*	*V*	*Zn*	*pH*
Al	1.00																									
Sb	--	1.00																								
As	0.81	--	1.00																							
Ba	0.56	--	0.46	1.00																						
Be	0.55	--	0.08	0.46	1.00																					
B	0.00	--	0.00	0.00	0.00	1.00																				
Cd	0.77	--	0.63	0.62	0.57	0.00	1.00																			
Ca	0.35	--	0.43	0.77	0.16	0.00	0.60	1.00																		
Cr	0.89	--	0.83	0.46	0.24	0.00	0.64	0.39	1.00																	
Co	0.82	--	0.75	0.58	0.37	0.00	0.62	0.56	0.88	1.00																
Cu	0.92	--	0.87	0.58	0.38	0.00	0.87	0.52	0.86	0.81	1.00															
Fe	0.70	--	0.80	0.34	0.06	0.00	0.32	0.35	0.82	0.90	0.66	1.00														
Pb	0.88	--	0.92	0.56	0.30	0.00	0.81	0.45	0.81	0.66	0.93	0.57	1.00													
Mg	0.79	--	0.72	0.81	0.47	0.00	0.79	0.79	0.77	0.92	0.83	0.71	0.71	1.00												
Mn	0.41	--	0.16	0.49	0.56	0.00	0.47	0.46	0.47	0.68	0.33	0.42	0.15	0.71	1.00											
Hg	0.60	--	0.67	0.02	0.19	0.00	0.48	-0.14	0.60	0.51	0.60	0.53	0.60	0.38	0.24	1.00										
Mo	0.61	--	0.76	-0.07	-0.13	0.00	0.16	-0.22	0.65	0.45	0.54	0.68	0.61	0.21	-0.17	0.71	1.00									
Ni	0.89	--	0.84	0.66	0.36	0.00	0.79	0.61	0.94	0.93	0.92	0.77	0.84	0.92	0.58	0.57	0.47	1.00								
K	0.76	--	0.44	0.82	0.79	0.00	0.64	0.58	0.56	0.71	0.63	0.46	0.57	0.82	0.62	0.12	0.05	0.69	1.00							
Se	0.71	--	0.83	0.13	0.06	0.00	0.36	0.00	0.73	0.71	0.68	0.84	0.64	0.50	0.18	0.85	0.89	0.66	0.25	1.00						
Ag	0.00	--	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00					
Na	0.62	--	0.37	0.15	0.42	0.00	0.56	-0.04	0.63	0.46	0.49	0.31	0.46	0.40	0.53	0.62	0.39	0.55	0.31	0.44	0.00	1.00				
Tl	0.18	--	-0.13	0.32	0.55	0.00	-0.03	-0.18	-0.14	-0.18	-0.06	-0.25	0.09	-0.07	-0.16	-0.20	-0.07	-0.13	0.46	-0.19	0.00	-0.10	1.00			
V	0.81	--	0.79	0.30	0.11	0.00	0.52	0.25	0.97	0.80	0.76	0.80	0.73	0.65	0.41	0.62	0.71	0.85	0.40	0.74	0.00	0.70	-0.24	1.00		
Zn	0.80	--	0.80	0.66	0.38	0.00	0.71	0.72	0.83	0.95	0.83	0.82	0.74	0.96	0.65	0.44	0.34	0.93	0.75	0.60	0.00	0.36	-0.14	0.73	1.00	
pH	0.29	--	0.28	0.77	0.33	0.00	0.53	0.92	0.30	0.60	0.41	0.36	0.27	0.80	0.68	-0.10	-0.35	0.56	0.65	0.00	0.00	-0.03	-0.15	0.15	0.72	1.00

- Yellow highlighted cells indicate moderatley stron correlation
- Orange highlighted cells indicate strong correlation

* - excluding stock tank sampling location SW04

TABLE 8
CORRELATION MATRICES FOR SOIL SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

NEAR SMELTER SOIL SAMPLES

	Al	*Sb*	*As*	*Ba*	*Be*	*B*	*Cd*	*Ca*	*Cr*	*Co*	*Cu*	*Fe*	*Pb*	*Mg*	*Mn*	*Hg*	*Mo*	*Ni*	*K*	*Se*	*Ag*	*Na*	*Tl*	*V*	*Zn*	*pH*
Al	1.00																									
Sb	0.00	1.00																								
As	0.14	0.00	1.00																							
Ba	0.48	0.00	0.79	1.00																						
Be	0.78	0.00	-0.15	0.04	1.00																					
B	--	--	--	--	--	1.00																				
Cd	0.56	0.00	0.28	0.21	0.81	--	1.00																			
Ca	0.70	0.00	-0.06	0.43	0.45	--	0.17	1.00																		
Cr	0.89	0.00	0.41	0.71	0.58	--	0.49	0.81	1.00																	
Co	0.87	0.00	0.46	0.60	0.74	--	0.77	0.60	0.92	1.00																
Cu	0.44	0.00	0.57	0.31	0.58	--	0.85	-0.12	0.41	0.71	1.00															
Fe	0.50	0.00	0.90	0.83	0.20	--	0.52	0.21	0.69	0.76	0.70	1.00														
Pb	0.37	0.00	0.92	0.82	0.10	--	0.47	0.25	0.65	0.70	0.62	0.96	1.00													
Mg	0.84	0.00	-0.01	0.44	0.60	--	0.34	0.97	0.89	0.74	0.08	0.33	0.32	1.00												
Mn	0.73	0.00	-0.39	0.03	0.70	--	0.34	0.85	0.64	0.53	-0.06	-0.05	-0.08	0.88	1.00											
Hg	0.10	0.00	0.86	0.53	-0.08	--	0.28	-0.36	0.19	0.31	0.64	0.70	0.64	-0.26	-0.49	1.00										
Mo	-0.10	0.00	0.90	0.52	-0.27	--	0.23	-0.42	0.08	0.23	0.59	0.77	0.76	-0.33	-0.65	0.84	1.00									
Ni	0.36	0.00	0.49	0.59	-0.01	--	0.18	-0.02	0.28	0.27	0.24	0.57	0.41	0.09	-0.08	0.50	0.49	1.00								
K	0.79	0.00	-0.22	0.00	0.82	--	0.61	0.47	0.56	0.66	0.42	0.21	0.08	0.66	0.71	-0.25	-0.24	0.16	1.00							
Se	-0.53	0.00	0.59	0.25	-0.66	--	-0.18	-0.65	-0.39	-0.33	0.13	0.33	0.36	-0.65	-0.84	0.59	0.79	0.45	-0.55	1.00						
Ag	0.17	0.00	0.70	0.49	-0.05	--	0.31	-0.38	0.13	0.26	0.56	0.68	0.53	-0.22	-0.41	0.82	0.80	0.86	0.02	0.66	1.00					
Na	-0.27	0.00	-0.10	0.23	-0.56	--	-0.62	0.08	-0.21	-0.50	-0.72	-0.26	-0.23	-0.08	-0.12	-0.18	-0.19	0.33	-0.48	0.28	-0.01	1.00				
Tl	0.56	0.00	-0.11	0.03	0.60	--	0.56	0.06	0.24	0.41	0.41	0.22	0.01	0.26	0.35	0.00	0.01	0.60	0.78	-0.12	0.46	-0.19	1.00			
V	0.82	0.00	0.38	0.81	0.43	--	0.30	0.84	0.94	0.77	0.20	0.61	0.58	0.87	0.59	0.13	0.02	0.38	0.41	-0.32	0.11	0.11	0.18	1.00		
Zn	0.86	0.00	0.31	0.63	0.65	--	0.55	0.86	0.97	0.91	0.38	0.60	0.59	0.92	0.72	0.06	-0.03	0.17	0.57	-0.49	-0.01	-0.23	0.23	0.92	1.00	
pH	0.60	0.00	-0.22	0.29	0.37	--	0.07	0.95	0.66	0.42	-0.31	0.03	0.05	0.89	0.89	-0.45	-0.56	0.03	0.41	-0.66	-0.40	0.24	0.10	0.73	0.73	1.00

- Yellow highlighted cells indicate moderatley stron correlation
- Orange highlighted cells indicate strong correlation

TABLE 8
CORRELATION MATRICES FOR SOIL SAMPLES

SURFACE WATER SAMPLING ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM
CHINO MINES COMPANY - HURLEY, NEW MEXICO

NEAR SW-04 SOIL SAMPLES

	Al	*Sb*	*As*	*Ba*	*Be*	*B*	*Cd*	*Ca*	*Cr*	*Co*	*Cu*	*Fe*	*Pb*	*Mg*	*Mn*	*Hg*	*Mo*	*Ni*	*K*	*Se*	*Ag*	*Na*	*Tl*	*V*	*Zn*	*pH*
Al	1.00																									
Sb	0.00	1.00																								
As	0.24	0.00	1.00																							
Ba	0.27	0.00	0.36	1.00																						
Be	0.90	0.00	0.55	0.44	1.00																					
B	-0.25	0.00	0.06	-0.56	-0.33	1.00																				
Cd	-0.07	0.00	0.69	0.52	0.21	-0.39	1.00																			
Ca	0.17	0.00	0.38	0.63	0.28	-0.03	0.21	1.00																		
Cr	0.60	0.00	0.66	0.09	0.65	-0.03	0.39	0.06	1.00																	
Co	0.17	0.00	0.45	0.82	0.30	-0.51	0.70	0.34	0.38	1.00																
Cu	0.28	0.00	0.54	0.85	0.43	-0.52	0.71	0.41	0.34	0.94	1.00															
Fe	0.21	0.00	0.59	0.56	0.33	-0.25	0.62	0.21	0.66	0.89	0.81	1.00														
Pb	0.09	0.00	0.83	0.52	0.39	-0.37	0.93	0.33	0.59	0.70	0.74	0.73	1.00													
Mg	0.79	0.00	-0.01	0.57	0.67	-0.60	-0.02	0.44	0.24	0.34	0.44	0.18	0.10	1.00												
Mn	0.05	0.00	-0.05	0.43	0.09	-0.31	0.24	0.25	0.19	0.42	0.15	0.28	0.15	0.20	1.00											
Hg	0.64	0.00	0.77	0.68	0.84	-0.42	0.66	0.38	0.66	0.67	0.79	0.65	0.76	0.54	0.13	1.00										
Mo	-0.10	0.00	0.82	0.46	0.17	0.15	0.66	0.37	0.47	0.66	0.63	0.78	0.75	-0.18	0.10	0.55	1.00									
Ni	0.69	0.00	0.54	0.67	0.75	-0.51	0.52	0.53	0.71	0.68	0.70	0.66	0.67	0.73	0.41	0.85	0.38	1.00								
K	0.97	0.00	0.13	0.14	0.82	-0.30	-0.09	0.07	0.65	0.12	0.18	0.20	0.07	0.76	0.15	0.54	-0.19	0.68	1.00							
Se	-0.08	0.00	0.44	0.78	0.15	-0.18	0.66	0.53	0.05	0.68	0.62	0.45	0.52	0.08	0.58	0.49	0.59	0.40	-0.18	1.00						
Ag	0.10	0.00	0.70	0.75	0.33	-0.29	0.78	0.34	0.42	0.92	0.93	0.89	0.81	0.15	0.18	0.75	0.86	0.59	0.00	0.69	1.00					
Na	0.42	0.00	-0.28	0.61	0.32	-0.72	-0.08	0.43	-0.18	0.35	0.42	0.06	-0.02	0.85	0.19	0.26	-0.30	0.48	0.39	0.10	0.10	1.00				
Tl	0.00	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00			
V	-0.23	0.00	0.59	0.65	0.09	-0.20	0.73	0.22	0.13	0.78	0.76	0.69	0.68	-0.17	0.16	0.50	0.79	0.25	-0.34	0.73	0.89	-0.06	0.00	1.00		
Zn	-0.03	0.00	0.82	0.48	0.29	-0.26	0.93	0.40	0.49	0.58	0.60	0.58	0.96	-0.01	0.24	0.67	0.72	0.58	-0.05	0.61	0.72	-0.12	0.00	0.64	1.00	
pH	0.56	0.00	-0.12	0.51	0.52	-0.53	0.00	0.45	-0.10	0.09	0.21	-0.23	-0.05	0.78	0.32	0.37	-0.40	0.47	0.51	0.28	-0.08	0.74	0.00	-0.19	-0.01	1.00

- Yellow highlighted cells indicate moderatley stron correlation
- Orange highlighted cells indicate strong correlation

FIGURES

Legend

Surface Water Samples

- SW-1 Labels for 2004 samples
- SW01 Labels for 2006 samples
- SW01 Labels for 2007 samples

- 4WD Road
- Local Road
- Main Road
- Railroads

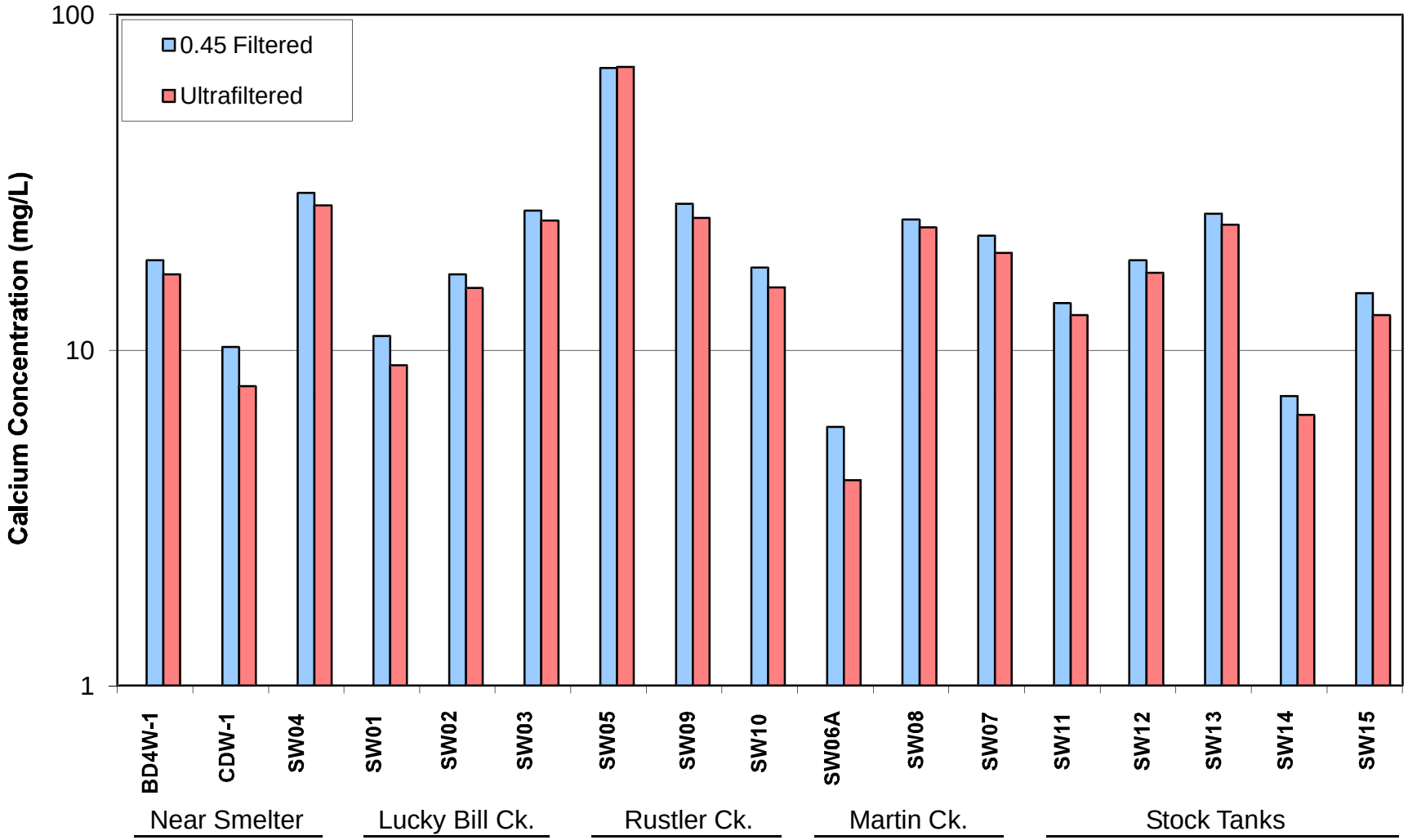
Aerial photo basemap source is 2005 DOQQ (Digital Ortho Quarter Quadrangles) imagery distributed by New Mexico's RGIS data clearinghouse.

Image resolution is one meter.

0 5,000 10,000 15,000 20,000 Feet

Prepared By: SRK Consulting / ARCADIS		Prepared for: Freeport-McMoRan Copper & Gold	
Revision Date: 06/20/2008	**Drawn/Approved:** JTG/LEC	**Surface Water Sampling Locations**	**Figure No:** 1
Scale: 1:66,860			
Project Number: 69543.04			
File Name: SWLocationERAseries.mxd			

09/24/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G01.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

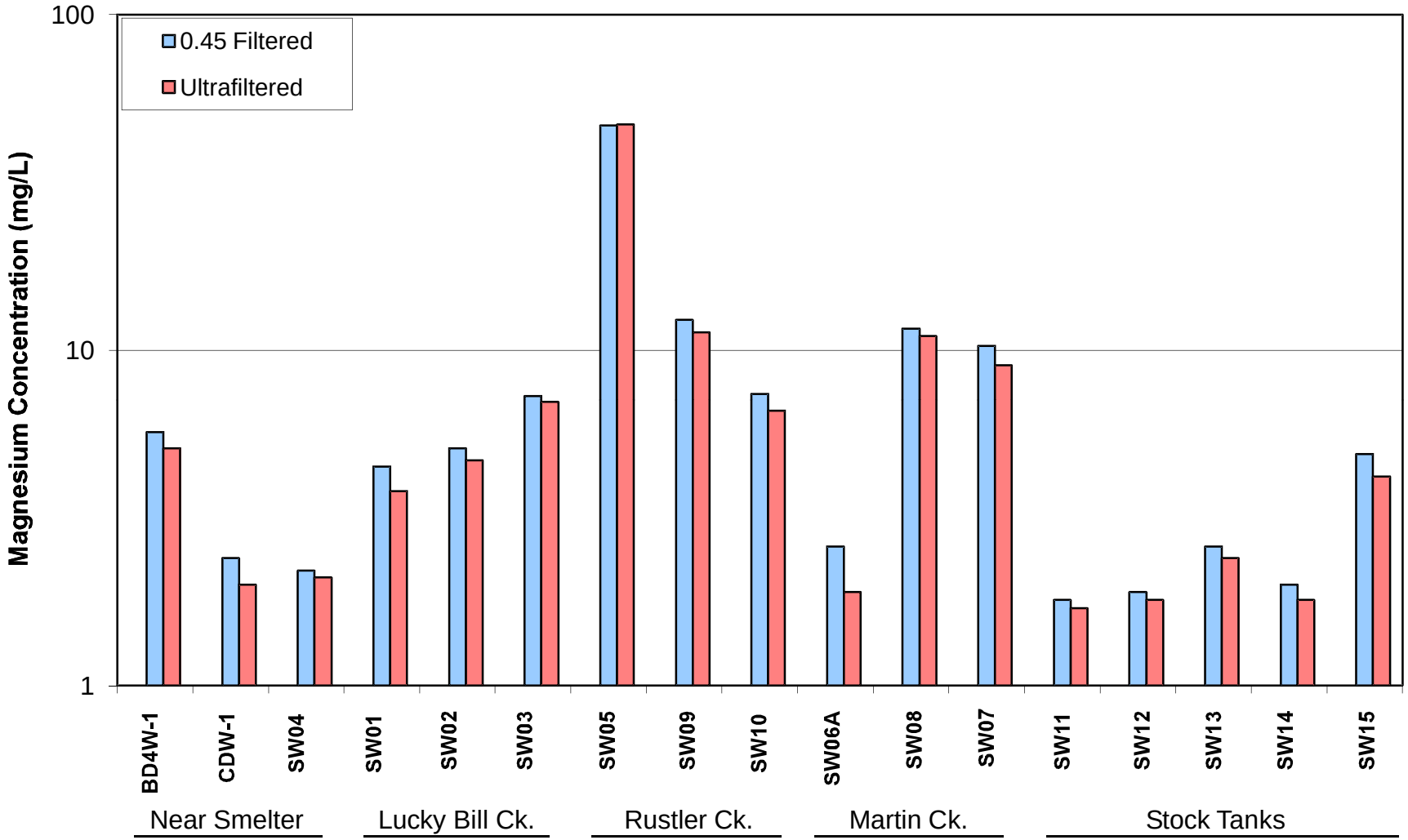
SIZE FRACTION CONCENTRATIONS FOR CALCIUM

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 2

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G02.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

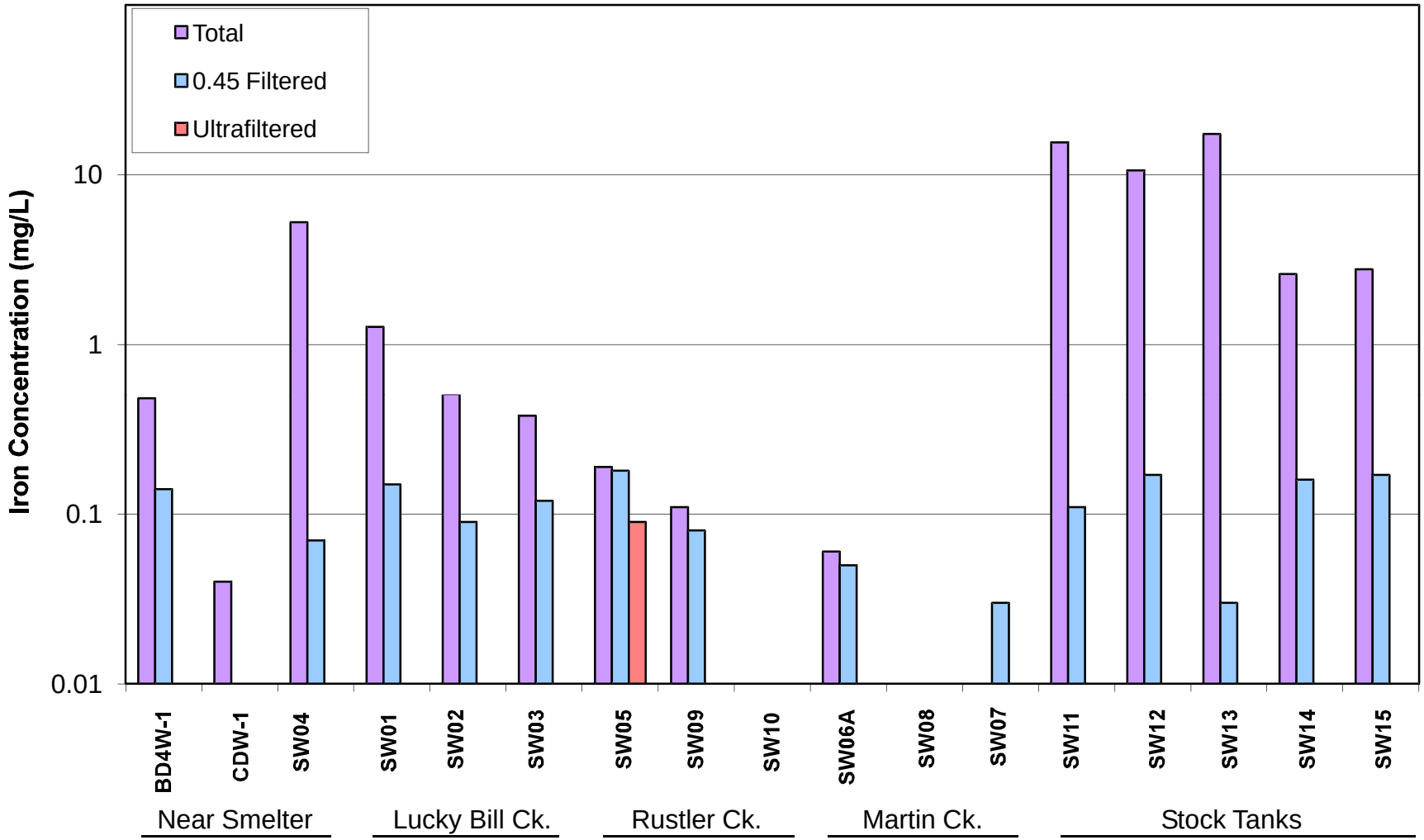
SIZE FRACTION CONCENTRATIONS FOR MAGNESIUM

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 3

09/24/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G03.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

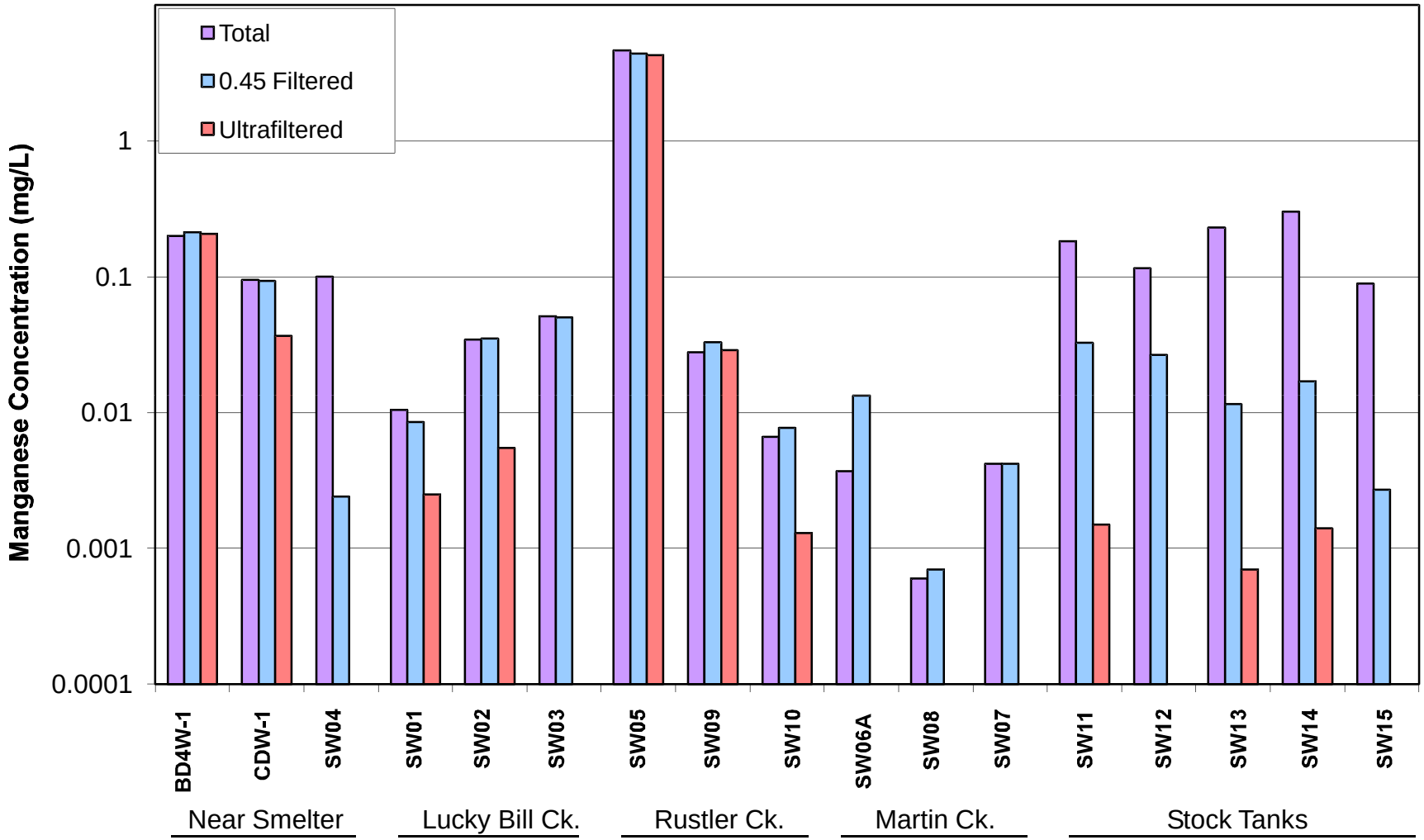
SIZE FRACTION CONCENTRATIONS FOR IRON

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE **4**

09/24/09 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G04.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

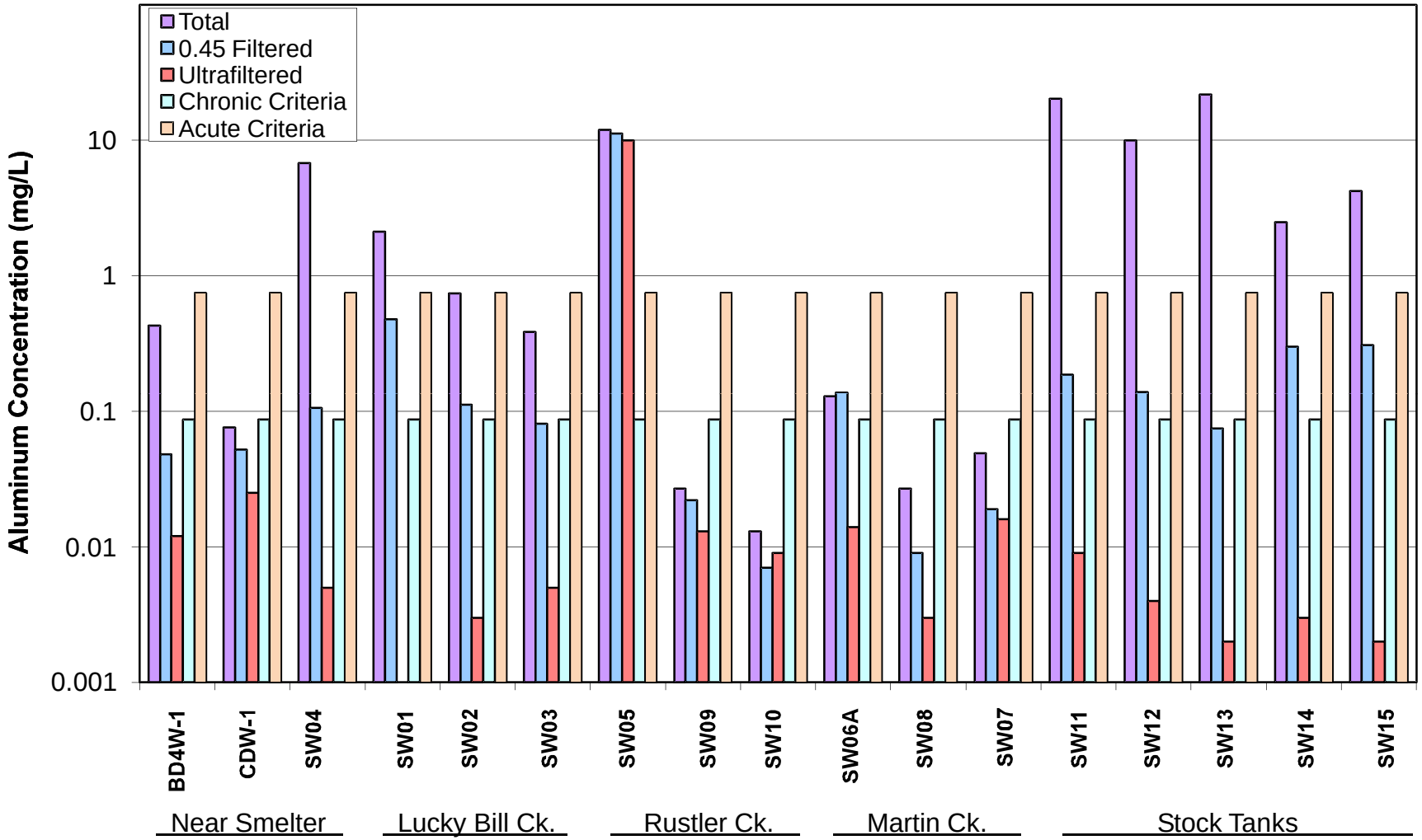
SIZE FRACTION CONCENTRATIONS FOR MANGANESE

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 5

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G05.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

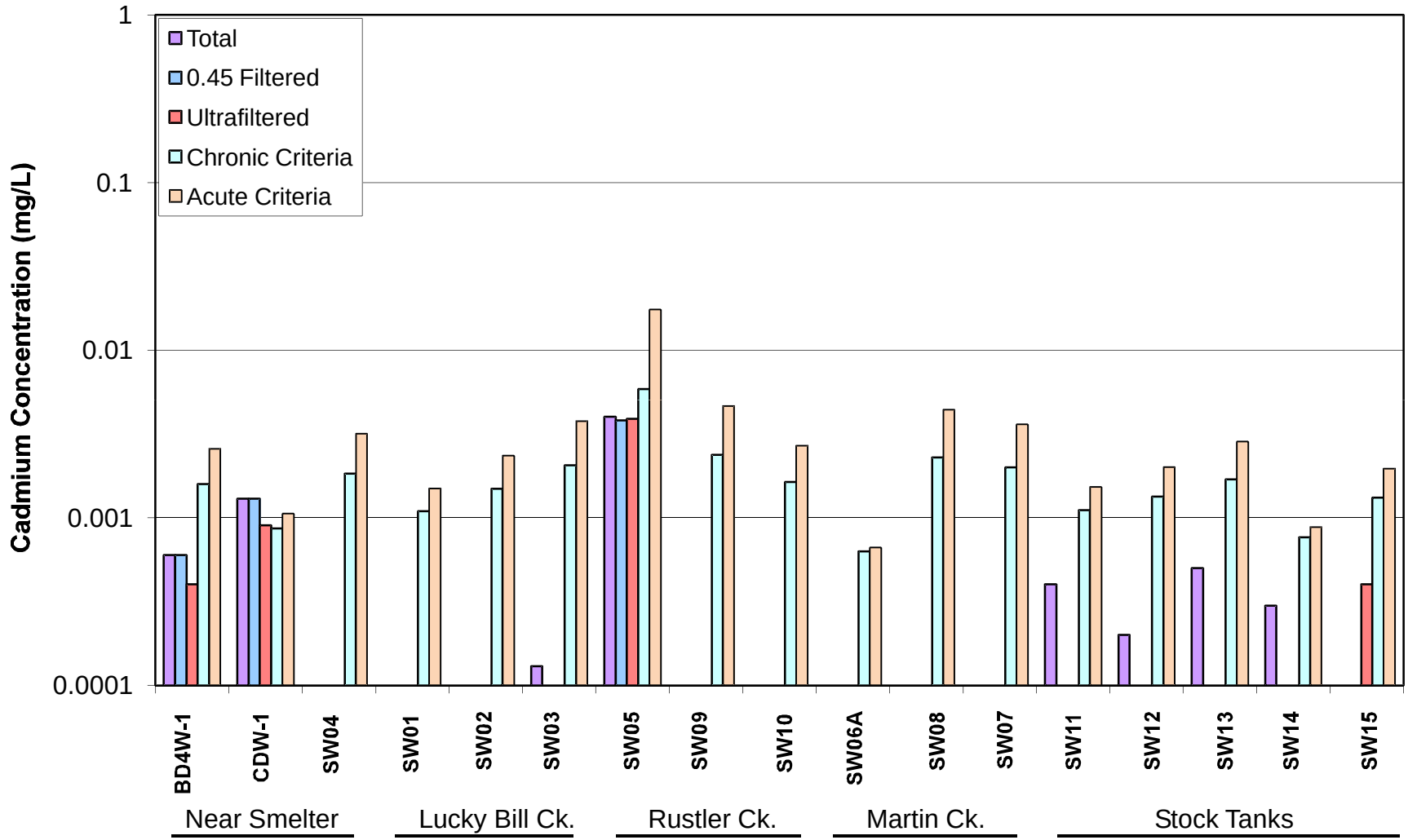
SIZE FRACTION CONCENTRATIONS FOR ALUMINUM

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 6

09/24/09 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G06.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

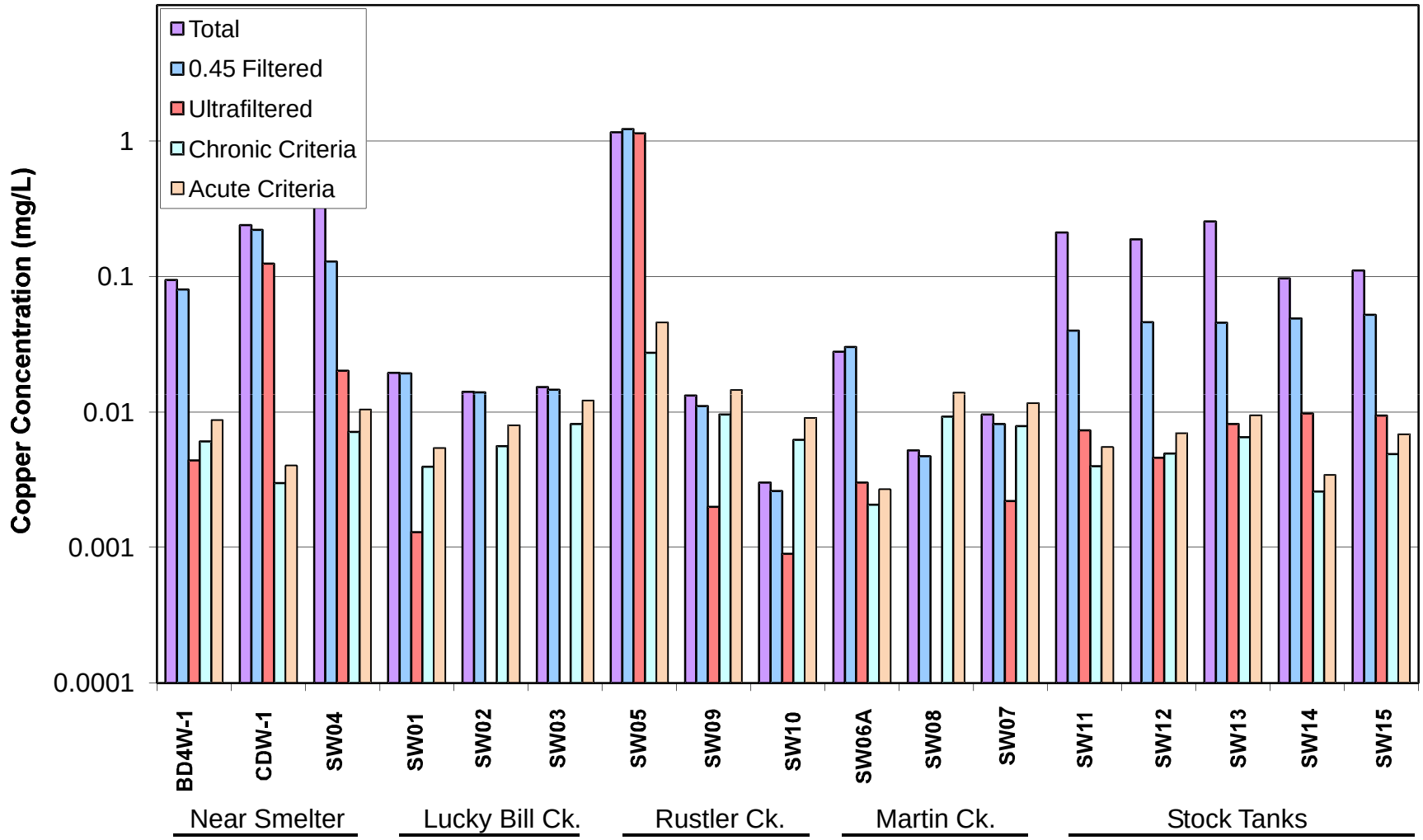
SIZE FRACTION CONCENTRATIONS FOR CADMIUM

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 7

09/24/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G07.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

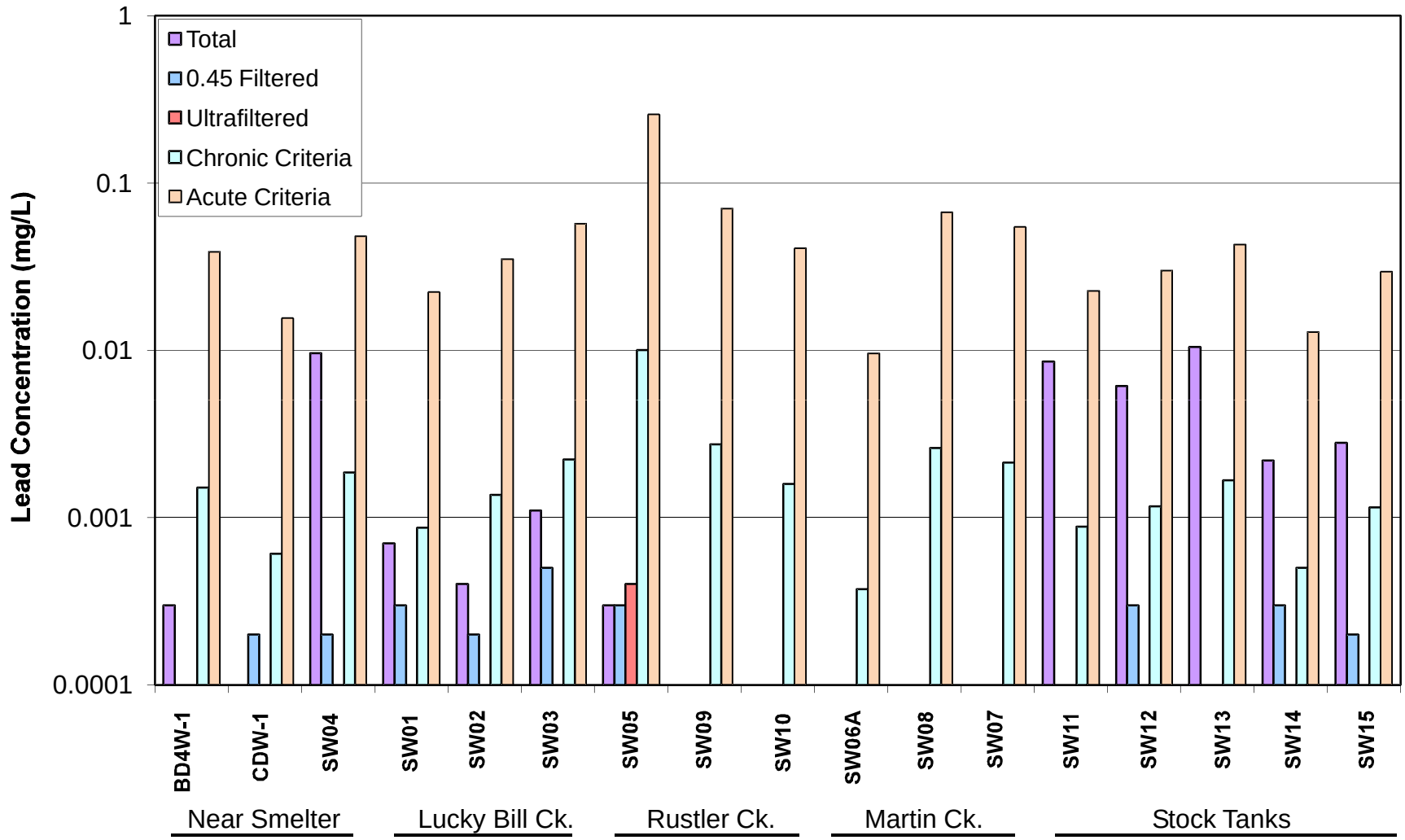
SIZE FRACTION CONCENTRATIONS FOR COPPER

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 8

09/24/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G08.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

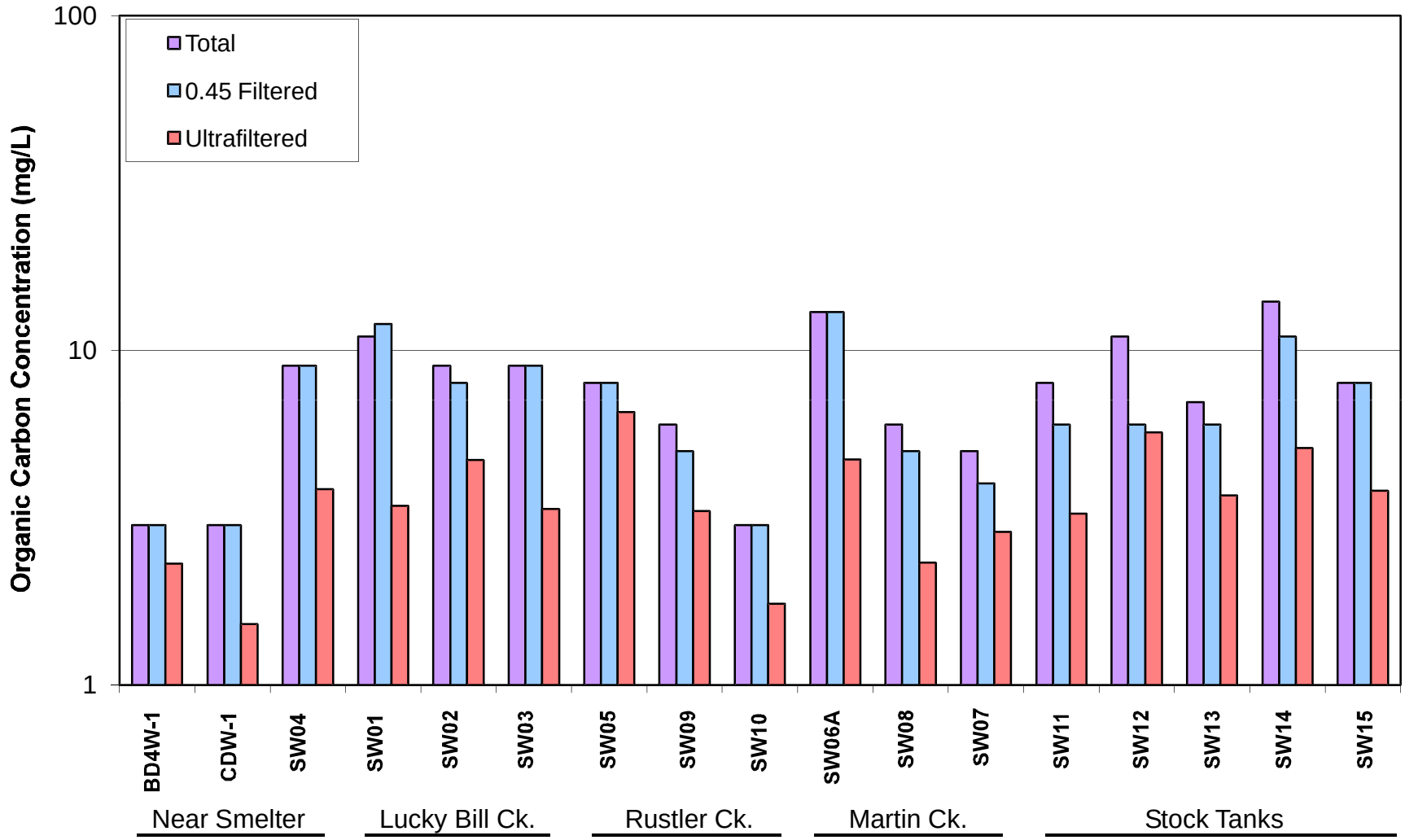
SIZE FRACTION CONCENTRATIONS FOR LEAD

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 9

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G09.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

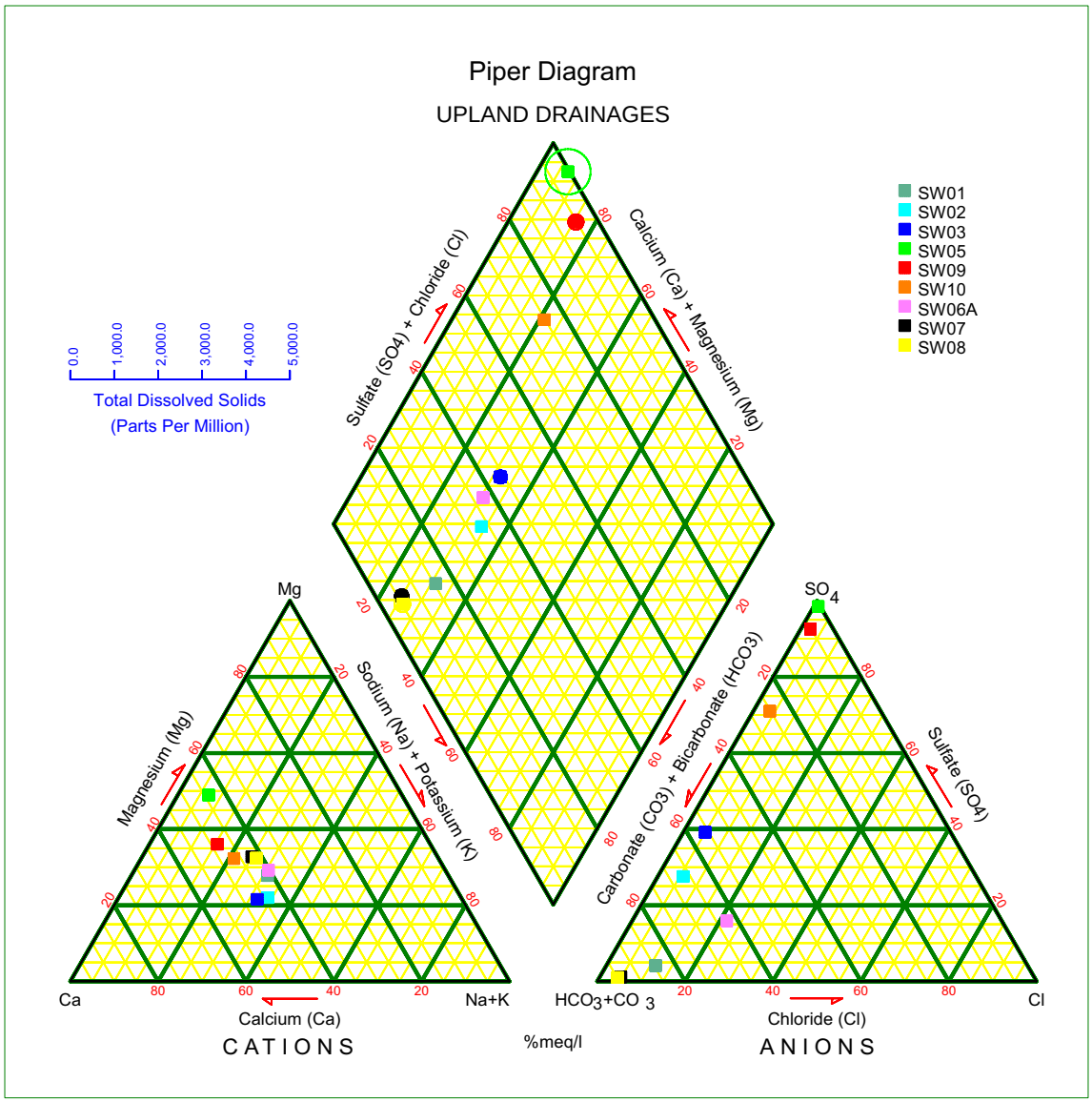
SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

SIZE FRACTION CONCENTRATIONS FOR ORGANIC CARBON

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 10



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

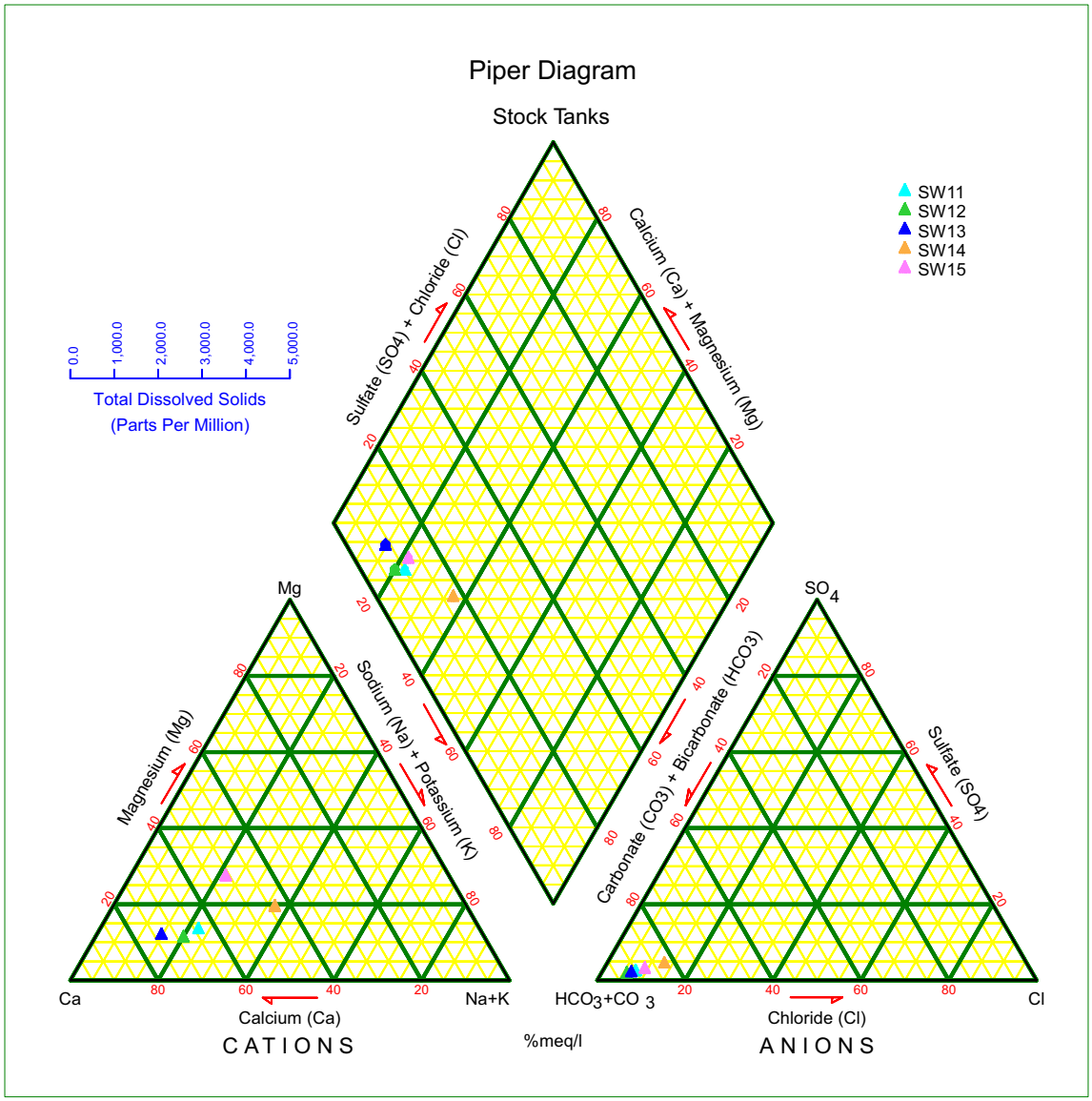
PIPER DIAGRAM FOR UPLAND DRAINAGE SAMPLES

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 11

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G10.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

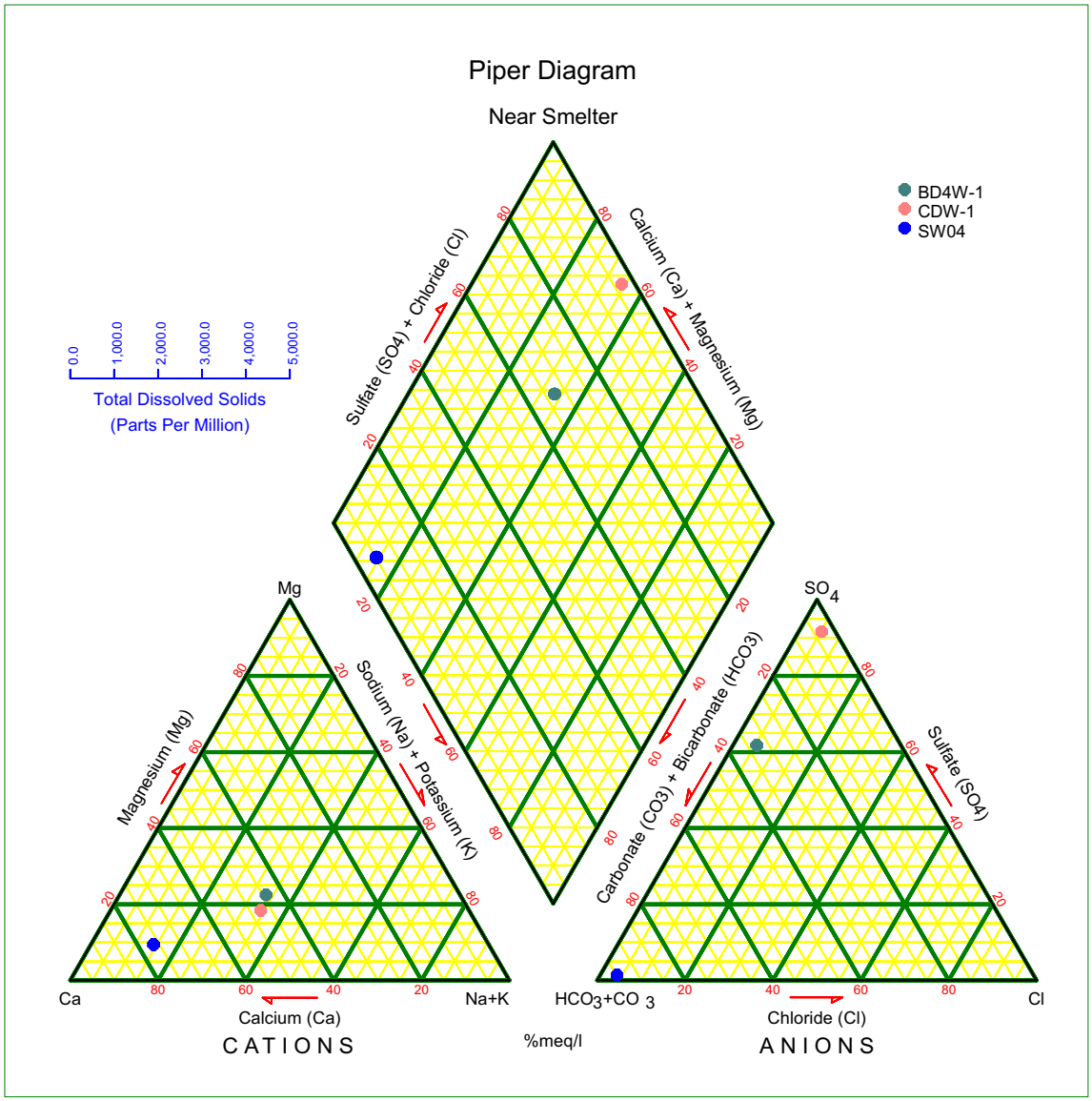
PIPER DIAGRAM FOR STOCK TANK SAMPLES

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 12

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G11.CDR



CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

PIPER DIAGRAM FOR NEAR SMELTER SAMPLES

PREPARED BY:

ARCADIS

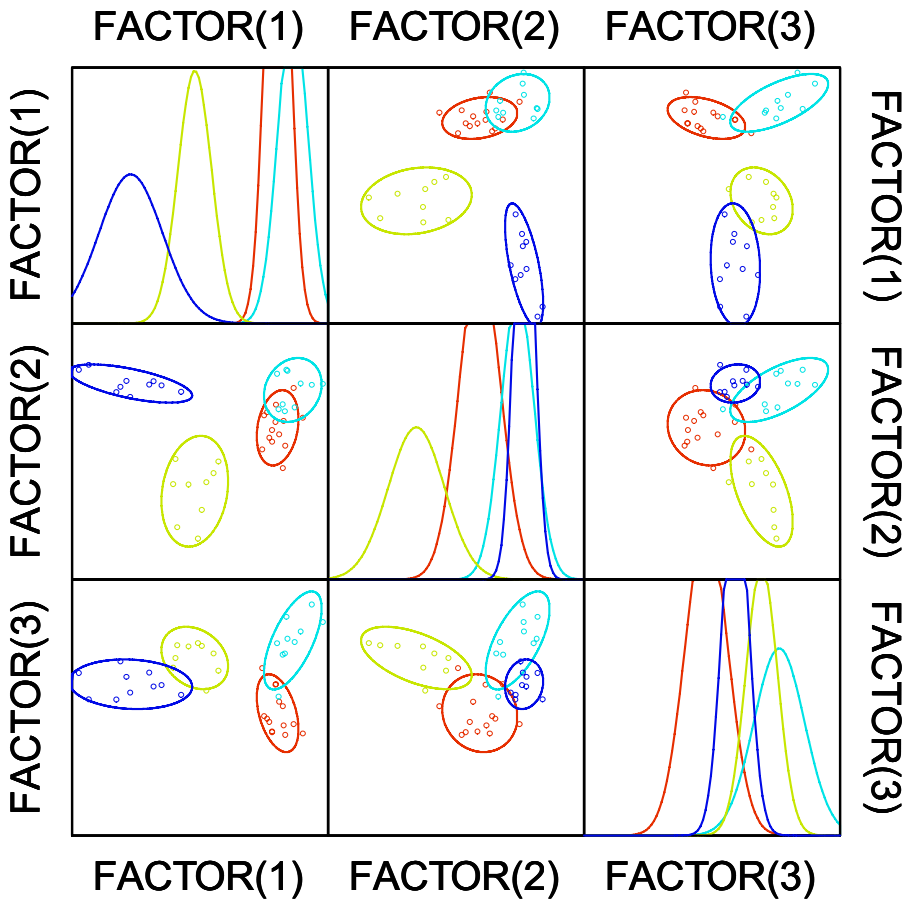
PREPARED FOR:

FREEPORT-MCMORAN COPPER & GOLD

FIGURE
13

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G12.CDR

Canonical Scores Plot



NOTES:

FACTOR 1 - ASSOCIATED WITH COPPER
FACTOR 2 - ASSOCIATED WITH MOLYBDENUM AND pH
FACTOR 3 - ASSOCIATED WITH MANGANESE
MODEL 1 - ALL VARIABLES INCLUDED WITH EXCEPTION OF VARIABLES WITH LIMITED DETECTIONS AND CROSS-CORRELATED VARIABLES

GROUP

- UPLAND DRAINAGES
- STOCK TANKS
- NEAR SMELTER
- NEAR SW04

CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

DISCRIMINANT ANALYSIS RESULTS FOR SOIL SAMPLES - MODEL 1

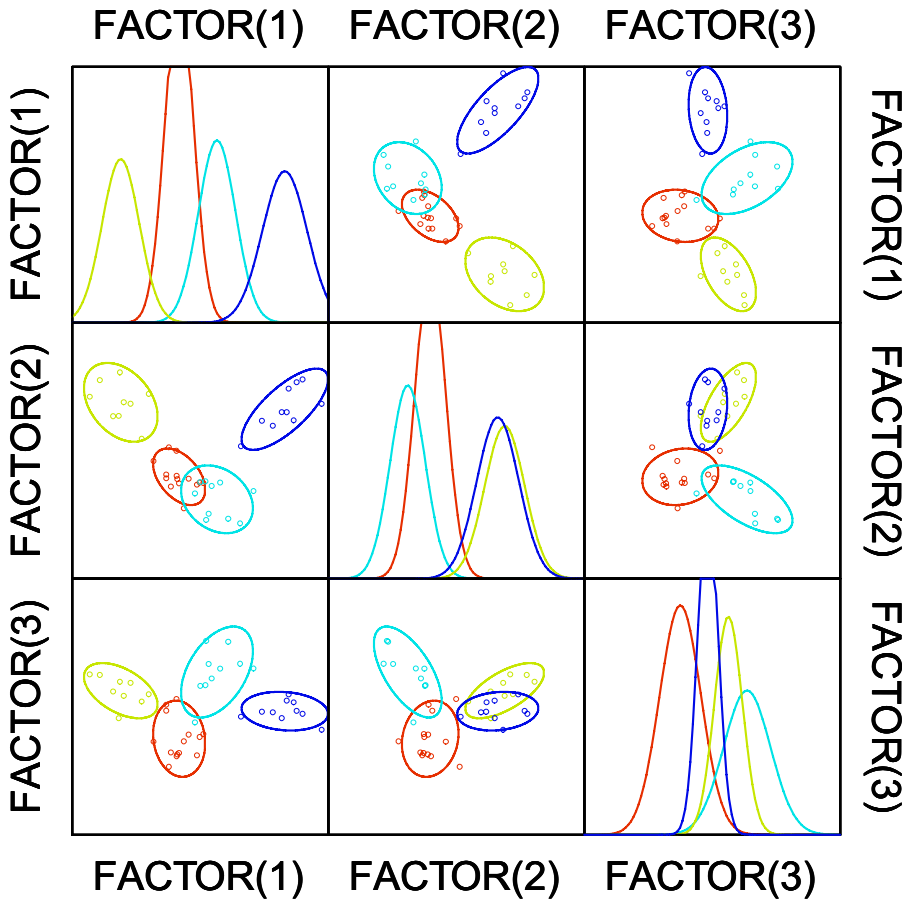
PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 14

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G13.CDR

Canonical Scores Plot



NOTES:

FACTOR 1 - ASSOCIATED WITH pH
FACTOR 2 - ASSOCIATED WITH ARSENIC, BARIUM CADMIUM, AND MOLYBDENUM
FACTOR 3 - ASSOCIATED WITH MANGANESE, MAGNESIUM, ALUMINUM, AND COBALT
MODEL 2 - SAME AS MODEL 1 WITH COPPER REMOVED AND ALUMINUM, CADMIUM AND ZINC ADDED BACK IN.

GROUP

- UPLAND DRAINAGES
- STOCK TANKS
- UPLAND DRAINAGES
- NEAR SW04

CHINO MINES COMPANY
HURLEY, NEW MEXICO

SURFACE WATER SAMPLING & ANALYSIS OF RAINFALL POOLS TECHNICAL MEMORANDUM

DISCRIMINANT ANALYSIS RESULTS FOR SOIL SAMPLES - MODEL 2

PREPARED BY: ARCADIS

PREPARED FOR: FREEPORT-MCMORAN COPPER & GOLD

FIGURE 15

06/18/08 SYR-141ENV-DJH
B0063531/0000/00001/CDR/63531G14.CDR

APPENDIX A

Field Measurements, Observations and Photo Log

Field Parameter Data Collected at SW Sample Locations for S/TS IU Supplemental RI, September 2007

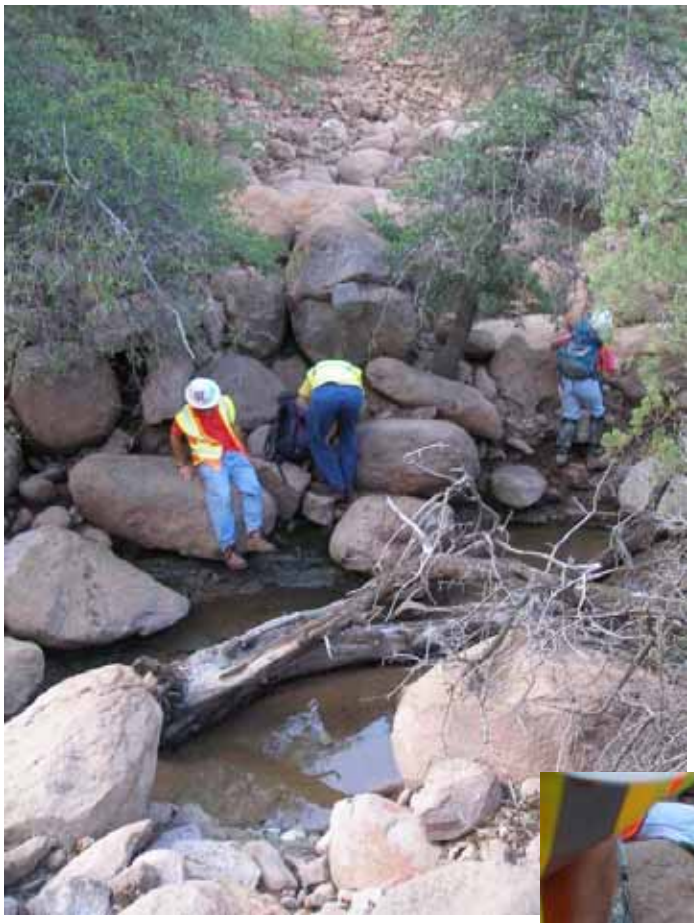
Location	Date	pH	SC uS/cm	DO mg/L	Temp deg C	Turbidity NTU	Location Type	Water Description
CDW-1	12-Sep-07	5.42	136	6.91	17.8	1.17	drainage	mod flow rate, clear, odorless
BD4W-1	13-Sep-07	6.39	221	4.3	22.3	5.14	drainage	low flow rate, clear w/ v. slight yellow cast, odorless
SW01	11-Sep-07	6.47	140	6.05	18.7	20.23	drainage	mod/high flow, clear w/tan cast, odorless
SW02	11-Sep-07	7.06	200	6.82	19.7	125.8	drainage	mod/high flow, clear w/ slight brown cast, odorless
SW03	11-Sep-07	7.52	288	6.99	21.6	4.27	drainage	mod/high flow, clear w/ slight brown cast, odorless
SW04	13-Sep-07	9.05	180	--	28.8	404.5	pond	turbid, light brown from turbidity, odorless
SW05	11-Sep-07	4.17	825	6.34	25.2	0.6	drainage	mod/high flow, clear, odorless
SW06A	11-Sep-07	6.74	79	6.32	20.8	12.05	drainage	v. low flow, clear w/ slight brown cast, odorless
SW07	14-Sep-07	7.63	241	5.96	25.2	1.29	drainage	low flow rate, clear, odorless
SW08	14-Sep-07	7.31	273	3.7	21.7	0.7	drainage	low flow rate, clear, odorless
SW09	15-Sep-07	6.36	292	8.05	18.1	0.54	drainage	mod flow rate, clear, odorless
SW10	15-Sep-07	6.46	196	6.98	20.7	0.37	drainage	mod flow rate, clear, odorless
SW11	12-Sep-07	7.23	118	3.90	24.4	410.9	pond	turbid, brown from turbidity, organic odor
SW12	12-Sep-07	7.3	145	4.07	23.3	223.5	pond	turbid, brown from turbidity, organic odor
SW13	12-Sep-07	7.25	202	3.96	23.6	497.1	pond	v. turbid, brown from turbidity, organic odor
SW14	12-Sep-07	9.21	107	9.84	28.7	111.3	pond	slightly/moderately turbid, greenish color from aglal growth, abundant floating alge and debris, odorless
SW15	13-Sep-07	7.93	151	6.61	28.6	91.32	pond	slightly turbid, tan to light brown from turbidity, algal growth and floating leaves & debris, slight organic odor

Notes: No value for DO recorded for sample SW04.
Description of flow rate was a visual qualitative estimate for the purpose of relative comparisons.

Sample BDW-4

Sample BDW-4

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**



Sample CDW-1

Sample CDW-1

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-01

Sample SW-01

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-02

Sample SW-02

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-03

Sample SW-03

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-04

Sample SW-04

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-05

Sample SW-05

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-06A

Sample SW-06A

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-07

Sample SW-07

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-08

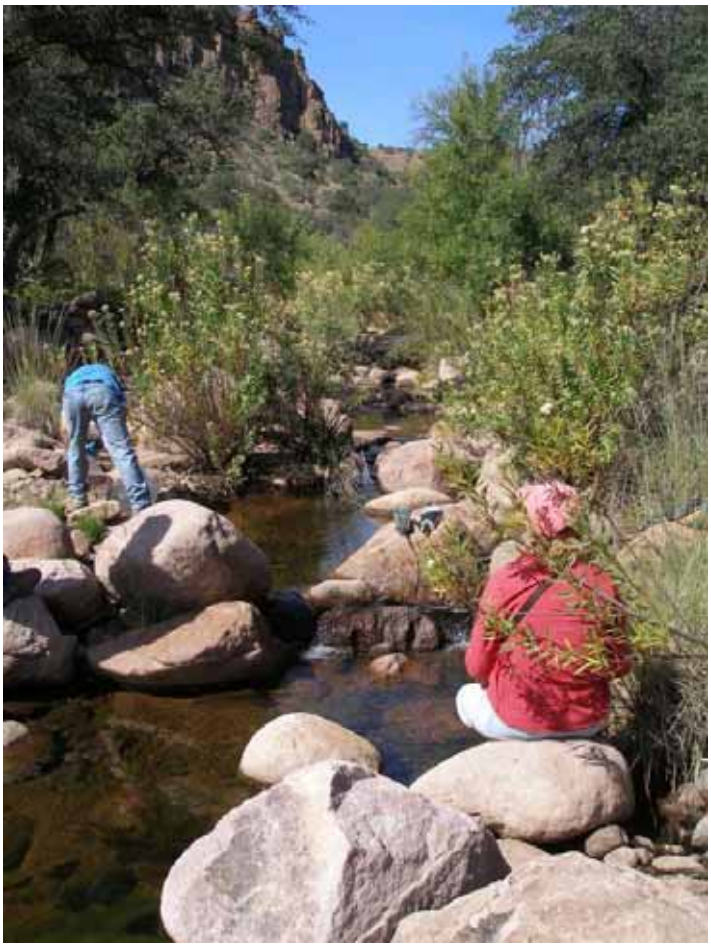
Sample SW-08

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-09

Sample SW-09

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE Sept. 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**



Sample SW-10

Sample SW-10

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-11

Sample SW-11

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-12

Sample SW-12

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-13

Sample SW-13

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-14

Sample SW-14

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

Sample SW-15

Sample SW-15

Selected Photographs		SRK Consulting Engineers and Scientists
PROJECT NO. 69543.04	DATE June 2008	**Addendum to Revised Chino Smelter/Tailing Soils IU RI**

APPENDIX B

ACZ Laboratory Reports

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

October 05, 2007

Report to:
Larry Cope
SRK Consulting
19 Old Twon Square Suite 238
Fort Coliins, CO 80524

Bill to:
Accounts Payable Dept
Phelps Dodge Mining Company
Chino Mines Company PO Box 13308
Phoenix, AZ 85002-3308

Project ID: OG01XB
ACZ Project ID: L65088

Larry Cope:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on September 18, 2007. This project has been assigned to ACZ's project number, L65088. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L65088. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 05, 2007. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl 05/Oct/07

Scott Habermehl, Project Manager, has reviewed and approved this report in its entirety.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: BD4W-1

ACZ Sample ID: ***L65088-01***
Date Sampled: *09/13/07 10:15*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:57	aml
Total Hot Plate Digestion	M200.2 ICP							09/26/07 11:34	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 8:12	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.048			mg/L	0.005	0.03	09/25/07 11:12	jjr
Aluminum, total	M200.8 ICP-MS	0.428		*	mg/L	0.001	0.005	09/24/07 20:50	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0006	B		mg/L	0.0005	0.003	09/25/07 11:12	jjr
Cadmium, total	M200.8 ICP-MS	0.0006	B		mg/L	0.0002	0.001	09/21/07 13:21	scp
Calcium, dissolved	M200.7 ICP	18.5			mg/L	0.2	1	09/26/07 9:44	djt
Copper, dissolved	M200.8 ICP-MS	0.080			mg/L	0.003	0.01	09/25/07 11:12	jjr
Copper, total	M200.8 ICP-MS	0.0943			mg/L	0.0005	0.003	09/24/07 20:50	msh
Iron, dissolved	M200.7 ICP	0.14			mg/L	0.02	0.05	09/26/07 9:44	djt
Iron, total	M200.7 ICP	0.48			mg/L	0.02	0.05	09/27/07 20:45	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:12	jjr
Lead, total	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/24/07 20:50	msh
Magnesium, dissolved	M200.7 ICP	5.7			mg/L	0.2	1	09/26/07 9:44	djt
Manganese, dissolved	M200.8 ICP-MS	0.213			mg/L	0.003	0.01	09/25/07 11:12	jjr
Manganese, total	M200.8 ICP-MS	0.200			mg/L	0.001	0.005	09/21/07 13:21	scp
Potassium, dissolved	M200.7 ICP	3.6			mg/L	0.3	2	09/26/07 9:44	djt
Sodium, dissolved	M200.7 ICP	13.9			mg/L	0.3	2	09/26/07 9:44	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: BD4W-1

ACZ Sample ID: ***L65088-01***
Date Sampled: *09/13/07 10:15*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		31			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		31			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	3	B	*	mg/L	1	5	09/21/07 3:04	jag
Carbon, total organic (TOC)	415.1 / SM5310B	3	B	*	mg/L	1	5	09/25/07 2:33	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		13.5			%			10/05/07 0:00	calc
Sum of Anions		1.6			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	70			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:15	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.04	B	*	mg/L	0.01	0.05	10/03/07 14:30	aml
Sulfate	375.4 - Turbidimetric	46		*	mg/L	5	30	09/27/07 9:08	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW313

ACZ Sample ID: ***L65088-02***
Date Sampled: *09/13/07 10:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:59	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 8:45	jjr
Total Hot Plate Digestion	M200.2 ICP							09/26/07 12:09	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.049			mg/L	0.005	0.03	09/25/07 11:17	jjr
Aluminum, total	M200.8 ICP-MS	0.223		*	mg/L	0.001	0.005	09/24/07 20:56	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0006	B		mg/L	0.0005	0.003	09/25/07 11:17	jjr
Cadmium, total	M200.8 ICP-MS	0.0006	B		mg/L	0.0002	0.001	09/21/07 13:25	scp
Calcium, dissolved	M200.7 ICP	19.2			mg/L	0.2	1	09/26/07 9:48	djt
Copper, dissolved	M200.8 ICP-MS	0.071			mg/L	0.003	0.01	09/25/07 11:17	jjr
Copper, total	M200.8 ICP-MS	0.0942			mg/L	0.0005	0.003	09/24/07 20:56	msh
Iron, dissolved	M200.7 ICP	0.14			mg/L	0.02	0.05	09/26/07 9:48	djt
Iron, total	M200.7 ICP	0.56			mg/L	0.02	0.05	09/27/07 21:06	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:17	jjr
Lead, total	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/24/07 20:56	msh
Magnesium, dissolved	M200.7 ICP	6.0			mg/L	0.2	1	09/26/07 9:48	djt
Manganese, dissolved	M200.8 ICP-MS	0.216			mg/L	0.003	0.01	09/25/07 11:17	jjr
Manganese, total	M200.8 ICP-MS	0.204			mg/L	0.001	0.005	09/21/07 13:25	scp
Potassium, dissolved	M200.7 ICP	3.7			mg/L	0.3	2	09/26/07 9:48	djt
Sodium, dissolved	M200.7 ICP	14.5			mg/L	0.3	2	09/26/07 9:48	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW313

ACZ Sample ID: ***L65088-02***
Date Sampled: *09/13/07 10:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		32			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		32			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	4	B	*	mg/L	1	5	09/21/07 3:18	jag
Carbon, total organic (TOC)	415.1 / SM5310B	4	B	*	mg/L	1	5	09/25/07 2:47	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		15.8			%			10/05/07 0:00	calc
Sum of Anions		1.6			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.2			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	73			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:16	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.03	B	*	mg/L	0.01	0.05	10/03/07 14:31	aml
Sulfate	375.4 - Turbidimetric	45		*	mg/L	5	30	09/27/07 9:08	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW15

ACZ Sample ID: ***L65088-03***
Date Sampled: *09/13/07 12:15*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 12:00	aml
Total Hot Plate Digestion	M200.2 ICP							09/26/07 12:21	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 9:19	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.307			mg/L	0.001	0.005	09/25/07 11:23	jjr
Aluminum, total	M200.8 ICP-MS	4.220		*	mg/L	0.001	0.005	09/24/07 21:02	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 11:23	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.001	0.005	09/21/07 13:30	scp
Calcium, dissolved	M200.7 ICP	14.8			mg/L	0.2	1	09/26/07 9:53	djt
Copper, dissolved	M200.8 ICP-MS	0.0522			mg/L	0.0005	0.003	09/25/07 11:23	jjr
Copper, total	M200.8 ICP-MS	0.1100			mg/L	0.0005	0.003	09/24/07 21:02	msh
Iron, dissolved	M200.7 ICP	0.17			mg/L	0.02	0.05	09/26/07 9:53	djt
Iron, total	M200.7 ICP	2.76			mg/L	0.02	0.05	09/27/07 21:10	djt
Lead, dissolved	M200.8 ICP-MS	0.0002	B		mg/L	0.0001	0.0005	09/25/07 11:23	jjr
Lead, total	M200.8 ICP-MS	0.0028			mg/L	0.0001	0.0005	09/24/07 21:02	msh
Magnesium, dissolved	M200.7 ICP	4.9			mg/L	0.2	1	09/26/07 9:53	djt
Manganese, dissolved	M200.8 ICP-MS	0.0027	B		mg/L	0.0005	0.003	09/25/07 11:23	jjr
Manganese, total	M200.8 ICP-MS	0.089			mg/L	0.005	0.03	09/21/07 13:30	scp
Potassium, dissolved	M200.7 ICP	6.3			mg/L	0.3	2	09/26/07 9:53	djt
Sodium, dissolved	M200.7 ICP	3.5			mg/L	0.3	2	09/26/07 9:53	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW15

ACZ Sample ID: ***L65088-03***
Date Sampled: *09/13/07 12:15*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		33			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		33			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/21/07 3:32	jag
Carbon, total organic (TOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/25/07 3:01	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		36.4			%			10/05/07 0:00	calc
Sum of Anions		0.7			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.5			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	57			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:21	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.09		*	mg/L	0.01	0.05	10/03/07 14:32	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/27/07 9:01	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW04

ACZ Sample ID: ***L65088-04***
Date Sampled: *09/13/07 16:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 12:02	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 9:52	jjr
Total Hot Plate Digestion	M200.2 ICP			*				09/26/07 12:33	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.106			mg/L	0.001	0.005	09/25/07 11:40	jjr
Aluminum, total	M200.8 ICP-MS	6.800		*	mg/L	0.001	0.005	09/24/07 21:18	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 11:40	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.001	0.005	09/21/07 13:35	scp
Calcium, dissolved	M200.7 ICP	29.4			mg/L	0.2	1	09/26/07 9:57	djt
Copper, dissolved	M200.8 ICP-MS	0.1290			mg/L	0.0005	0.003	09/25/07 11:40	jjr
Copper, total	M200.8 ICP-MS	0.6900			mg/L	0.0005	0.003	09/24/07 21:18	msh
Iron, dissolved	M200.7 ICP	0.07			mg/L	0.02	0.05	09/26/07 9:57	djt
Iron, total	M200.7 ICP	5.23			mg/L	0.04	0.1	09/27/07 21:14	djt
Lead, dissolved	M200.8 ICP-MS	0.0002	B		mg/L	0.0001	0.0005	09/25/07 11:40	jjr
Lead, total	M200.8 ICP-MS	0.0096			mg/L	0.0001	0.0005	09/24/07 21:18	msh
Magnesium, dissolved	M200.7 ICP	2.2			mg/L	0.2	1	09/26/07 9:57	djt
Manganese, dissolved	M200.8 ICP-MS	0.0024	B		mg/L	0.0005	0.003	09/25/07 11:40	jjr
Manganese, total	M200.8 ICP-MS	0.100			mg/L	0.005	0.03	09/21/07 13:35	scp
Potassium, dissolved	M200.7 ICP	9.2			mg/L	0.3	2	09/26/07 9:57	djt
Sodium, dissolved	M200.7 ICP	0.9	B		mg/L	0.3	2	09/26/07 9:57	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW04

ACZ Sample ID: ***L65088-04***
Date Sampled: *09/13/07 16:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		86			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3		3	B		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		89			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/27/07 20:46	scp
Carbon, total organic (TOC)	415.1 / SM5310B	9	B	*	mg/L	2	10	09/25/07 3:15	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		2.7			%			10/05/07 0:00	calc
Sum of Anions		1.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.9			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 15:42	jlf
Hardness as CaCO3	SM2340B - Calculation	83			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:22	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.49		*	mg/L	0.02	0.1	10/03/07 14:51	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/27/07 9:01	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: ER-1

ACZ Sample ID: ***L65088-05***
Date Sampled: *09/13/07 17:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 12:06	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 15:02	jjr
Total Hot Plate Digestion	M200.2 ICP							09/26/07 12:44	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.002	B		mg/L	0.001	0.005	09/25/07 11:46	jjr
Aluminum, total	M200.8 ICP-MS	0.004	B		mg/L	0.001	0.005	10/02/07 10:31	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 11:46	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 13:40	scp
Calcium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 10:01	djt
Copper, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:46	jjr
Copper, total	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/24/07 21:24	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/26/07 10:01	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/27/07 21:18	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 11:46	jjr
Lead, total	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/24/07 21:24	msh
Magnesium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 10:01	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:46	jjr
Manganese, total	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/21/07 13:40	scp
Potassium, dissolved	M200.7 ICP		U		mg/L	0.3	2	09/26/07 10:01	djt
Sodium, dissolved	M200.7 ICP	3.4			mg/L	0.3	2	09/26/07 10:01	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: ER-1

ACZ Sample ID: ***L65088-05***
Date Sampled: *09/13/07 17:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		3	B		mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		3	B		mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/27/07 21:14	scp
Carbon, total organic (TOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/25/07 3:29	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		n/a			%			10/05/07 0:00	calc
Sum of Anions		0.1	B		meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		0.1	B		meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/24/07 15:42	jlf
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:24	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	10/03/07 14:36	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/27/07 9:01	jlf

** Please refer to Qualifier Reports for details.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65088***

Alkalinity as CaCO3 SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232898													
WG232898PBW1	PBW	09/24/07 10:22				U	mg/L		-20	20			
WG232898LCSW2	LCSW	09/24/07 10:34	WC070917-1	820		829.4	mg/L	101.1	90	110			
WG232898PBW2	PBW	09/24/07 13:24				U	mg/L		-20	20			
WG232898LCSW5	LCSW	09/24/07 13:36	WC070917-1	820		837.7	mg/L	102.2	90	110			
L65103-02DUP	DUP	09/24/07 16:17			56	55.6	mg/L				0.7	20	
WG232898PBW3	PBW	09/24/07 16:23				U	mg/L		-20	20			
WG232898LCSW8	LCSW	09/24/07 16:35	WC070917-1	820		839.1	mg/L	102.3	90	110			
WG232898PBW4	PBW	09/24/07 19:48				U	mg/L		-20	20			
WG232898LCSW11	LCSW	09/24/07 20:01	WC070917-1	820		841.1	mg/L	102.6	90	110			
WG232898LCSW14	LCSW	09/25/07 0:09	WC070917-1	820		846.1	mg/L	103.2	90	110			

Aluminum, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.1		.1043	mg/L	104.3	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.003	0.003			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.0465	mg/L	93	85	115			
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	.007	.0515	mg/L	89	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	.007	.0507	mg/L	87.4	70	130	1.57	20	

Aluminum, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232961													
WG232961ICV	ICV	09/24/07 18:53	MS070913-2	.1		.1048	mg/L	104.8	90	110			
WG232961ICB	ICB	09/24/07 18:59				U	mg/L		-0.003	0.003			
WG232571LRB	LRB	09/24/07 19:04				.0104	mg/L		-0.0022	0.0022			B7
WG232571LFB	LFB	09/24/07 19:10	MS070917-3	.05		.0529	mg/L	105.8	85	115			
L65087-02LFM	LFM	09/24/07 20:22	MS070917-3	.05	.052	.1013	mg/L	98.6	70	130			
L65087-02LFMD	LFMD	09/24/07 20:28	MS070917-3	.05	.052	.1041	mg/L	104.2	70	130	2.73	20	
WG233448													
WG233448ICV	ICV	10/02/07 8:49	MS070913-2	.1		.1066	mg/L	106.6	90	110			
WG233448ICB	ICB	10/02/07 8:55				U	mg/L		-0.003	0.003			
WG233195LRB	LRB	10/02/07 9:00				U	mg/L		-0.0022	0.0022			
WG233195LFB	LFB	10/02/07 9:06	MS070917-3	.05		.0473	mg/L	94.6	85	115			
L65087-03LFM	LFM	10/02/07 10:14	MS070917-3	.05	.001	.0481	mg/L	94.2	70	130			
L65087-03LFMD	LFMD	10/02/07 10:20	MS070917-3	.05	.001	.0468	mg/L	91.6	70	130	2.74	20	

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.05431	mg/L	108.6	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0003	0.0003			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.04889	mg/L	97.8	85	115			
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	U	.04981	mg/L	99.6	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	U	.04955	mg/L	99.1	70	130	0.52	20	

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65088***

Cadmium, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232744													
WG232744ICV	ICV	09/21/07 11:12	MS070913-2	.05		.05073	mg/L	101.5	90	110			
WG232744ICB	ICB	09/21/07 11:17				U	mg/L		-0.0003	0.0003			
WG232571LRB	LRB	09/21/07 11:23				U	mg/L		-0.00022	0.00022			
WG232571LFB	LFB	09/21/07 11:28	MS070917-3	.05		.0437	mg/L	87.4	85	115			
L65087-02LFM	LFM	09/21/07 12:46	MS070917-3	.05	U	.04627	mg/L	92.5	70	130			
L65087-02LFMD	LFMD	09/21/07 12:51	MS070917-3	.05	U	.04532	mg/L	90.6	70	130	2.07	20	

Calcium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	100		97.58	mg/L	97.6	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.6	0.6			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	67.97008		75.08	mg/L	110.5	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	67.97008	24.5	98.78	mg/L	109.3	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	67.97008	24.5	98.83	mg/L	109.4	85	115	0.05	20	

Carbon, dissolved organic (DOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232755													
WG232755ICV	ICV	09/20/07 16:52	WI070822-1	75		69.6	mg/L	92.8	90	110			
WG232755ICB	ICB	09/20/07 17:06				U	mg/L		-3	3			
WG232755LFB2	LFB	09/20/07 23:59	WI070918-1	50		46.6	mg/L	93.2	90	110			
L65029-01AS	AS	09/21/07 0:41	WI070918-1	50	3	46.3	mg/L	86.6	90	110			M2
L65029-06DUP	DUP	09/21/07 1:10			11	10.6	mg/L				3.7	20	
WG232755LFB1	LFB	09/21/07 12:20	WI070918-1	50		46.4	mg/L	92.8	90	110			
WG233015													
WG233015ICV	ICV	09/27/07 16:30	WI070822-1	75		70.4	mg/L	93.9	90	110			
WG233015ICB	ICB	09/27/07 16:44				U	mg/L		-3	3			
WG233015LFB	LFB	09/27/07 16:58	WI070918-1	50		49.9	mg/L	99.8	90	110			
L65088-04AS	AS	09/27/07 21:00	WI070918-1	50	9	60	mg/L	102	90	110			
L65088-05DUP	DUP	09/27/07 21:28			U	U	mg/L				0	20	RA

Carbon, total organic (TOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232943													
WG232943ICV	ICV	09/24/07 17:04	WI070822-1	75		77.5	mg/L	103.3	90	110			
WG232943ICB	ICB	09/24/07 17:18				U	mg/L		-3	3			
WG232943LFB1	LFB	09/24/07 17:32	WI070918-1	50		47.2	mg/L	94.4	90	110			
L65087-02AS	AS	09/25/07 0:53	WI070918-1	50	5	58	mg/L	106	90	110			
L65087-03DUP	DUP	09/25/07 1:21			U	U	mg/L				0	20	RA

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65088***

Chloride 325.2 / SM4500Cl-E

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232948													
WG232948ICB	ICB	09/24/07 14:29				U	mg/L		-3	3			
WG232948ICV	ICV	09/24/07 14:29	WI070314-1	55		57	mg/L	103.6	90	110			
WG232948LFB1	LFB	09/24/07 14:48	WI070712-1	30		31.3	mg/L	104.3	90	110			
WG232948LFB2	LFB	09/24/07 15:27	WI070712-1	30		32.6	mg/L	108.7	90	110			
L65036-10AS	AS	09/24/07 15:27	WI070712-1	30	U	30.8	mg/L	102.7	90	110			
L65036-11DUP	DUP	09/24/07 15:27			U	U	mg/L				0	20	RA
L65088-04AS	AS	09/24/07 15:42	WI070712-1	30	2	34.1	mg/L	107	90	110			
L65088-05DUP	DUP	09/24/07 15:42			3	2.6	mg/L				14.3	20	RA

Copper, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.05485	mg/L	109.7	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0015	0.0015			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.05025	mg/L	100.5	85	115			
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	.0026	.05034	mg/L	95.5	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	.0026	.05029	mg/L	95.4	70	130	0.1	20	

Copper, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232961													
WG232961ICV	ICV	09/24/07 18:53	MS070913-2	.05		.0514	mg/L	102.8	90	110			
WG232961ICB	ICB	09/24/07 18:59				U	mg/L		-0.0015	0.0015			
WG232571LRB	LRB	09/24/07 19:04				U	mg/L		-0.0011	0.0011			
WG232571LFB	LFB	09/24/07 19:10	MS070917-3	.05		.05282	mg/L	105.6	85	115			
L65087-02LFM	LFM	09/24/07 20:22	MS070917-3	.05	.0096	.05905	mg/L	98.9	70	130			
L65087-02LFMD	LFMD	09/24/07 20:28	MS070917-3	.05	.0096	.0583	mg/L	97.4	70	130	1.28	20	

Iron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	2		1.962	mg/L	98.1	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.06	0.06			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	1		1.078	mg/L	107.8	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	1	U	1.094	mg/L	109.4	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	1	U	1.088	mg/L	108.8	85	115	0.55	20	

Iron, total M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233175													
WG233175ICV	ICV	09/27/07 20:04	II070922-1	2		1.965	mg/L	98.3	95	105			
WG233175ICB	ICB	09/27/07 20:08				U	mg/L		-0.06	0.06			
WG233029LRB	LRB	09/27/07 20:25				U	mg/L		-0.044	0.044			
WG233029LFB	LFB	09/27/07 20:29	II070920-4	1		.989	mg/L	98.9	85	115			
L65088-01LFM	LFM	09/27/07 20:49	II070920-4	1	.48	1.584	mg/L	110.4	70	130			
L65088-01LFMD	LFMD	09/27/07 21:02	II070920-4	1	.48	1.561	mg/L	108.1	70	130	1.46	20	

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65088***

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.0547	mg/L	109.4	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0003	0.0003			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.04909	mg/L	98.2	85	115			
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	U	.04831	mg/L	96.6	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	U	.04829	mg/L	96.6	70	130	0.04	20	

Lead, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232961													
WG232961ICV	ICV	09/24/07 18:53	MS070913-2	.05		.04995	mg/L	99.9	90	110			
WG232961ICB	ICB	09/24/07 18:59				U	mg/L		-0.0003	0.0003			
WG232571LRB	LRB	09/24/07 19:04				U	mg/L		-0.00022	0.00022			
WG232571LFB	LFB	09/24/07 19:10	MS070917-3	.05		.05123	mg/L	102.5	85	115			
L65087-02LFM	LFM	09/24/07 20:22	MS070917-3	.05	U	.05157	mg/L	103.1	70	130			
L65087-02LFMD	LFMD	09/24/07 20:28	MS070917-3	.05	U	.05084	mg/L	101.7	70	130	1.43	20	

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	100		98.62	mg/L	98.6	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.6	0.6			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	54.96908		59.99	mg/L	109.1	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	54.96908	11.6	72.11	mg/L	110.1	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	54.96908	11.6	71.8	mg/L	109.5	85	115	0.43	20	

Manganese, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.05434	mg/L	108.7	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0015	0.0015			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.05047	mg/L	100.9	85	115			
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	.0077	.05635	mg/L	97.3	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	.0077	.05616	mg/L	96.9	70	130	0.34	20	

Manganese, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232744													
WG232744ICV	ICV	09/21/07 11:12	MS070913-2	.05		.05139	mg/L	102.8	90	110			
WG232744ICB	ICB	09/21/07 11:17				U	mg/L		-0.0015	0.0015			
WG232571LRB	LRB	09/21/07 11:23				U	mg/L		-0.0011	0.0011			
WG232571LFB	LFB	09/21/07 11:28	MS070917-3	.05		.04425	mg/L	88.5	85	115			
L65087-02LFM	LFM	09/21/07 12:46	MS070917-3	.05	.0042	.04695	mg/L	85.5	70	130			
L65087-02LFMD	LFMD	09/21/07 12:51	MS070917-3	.05	.0042	.04595	mg/L	83.5	70	130	2.15	20	

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65088***

Nitrate/Nitrite as N M353.2 - H2SO4 preserved

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233335													
WG233335ICV	ICV	09/28/07 17:46	WI070911-1	2.416		2.432	mg/L	100.7	90	110			
WG233335ICB	ICB	09/28/07 17:47				U	mg/L		-0.06	0.06			
WG233338													
WG233338ICV	ICV	09/28/07 20:47	WI070911-1	2.416		2.529	mg/L	104.7	90	110			
WG233338ICB	ICB	09/28/07 20:48				U	mg/L		-0.06	0.06			
WG233338LFB1	LFB	09/28/07 20:49	WI070911-4	2		2.115	mg/L	105.8	90	110			
L65087-03AS	AS	09/28/07 21:10	WI070911-4	2	U	2.075	mg/L	103.8	90	110			
L65087-04DUP	DUP	09/28/07 21:13			U	U	mg/L				0	20	RA
WG233338LFB2	LFB	09/28/07 21:27	WI070911-4	2		2.114	mg/L	105.7	90	110			

Phosphorus, total M365.1 - Auto Ascorbic Acid (digest)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233579													
WG233361ICV	ICV	10/03/07 12:37	WI070329-1	.65228		.678	mg/L	103.9	90	110			
WG233361ICB	ICB	10/03/07 12:39				U	mg/L		-0.03	0.03			
WG233585													
WG233390ICV	ICV	10/03/07 14:13	WI070329-1	.65228		.672	mg/L	103	90	110			
WG233390ICB	ICB	10/03/07 14:15				U	mg/L		-0.03	0.03			
WG233390LRB	LRB	10/03/07 14:16				U	mg/L		-0.03	0.03			
WG233390LFB	LFB	10/03/07 14:17	WI070919-4	.5		.501	mg/L	100.2	90	110			
L64961-02LFM	LFM	10/03/07 14:19	WI070919-4	.5	U	.497	mg/L	99.4	90	110			
L65088-05DUP	DUP	10/03/07 14:37			U	U	mg/L				0	20	RA
L64961-03DUP	DUP	10/03/07 14:50			U	U	mg/L				0	20	RA
L65088-04LFM	LFM	10/03/07 14:52	WI070919-4	.5	.49	1.149	mg/L	131.8	90	110			M3

Potassium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	20		19.92	mg/L	99.6	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.9	0.9			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	99.76186		111.29	mg/L	111.6	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	99.76186	2.6	116.06	mg/L	113.7	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	99.76186	2.6	115.33	mg/L	113	85	115	0.63	20	

Sodium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	100		99.25	mg/L	99.3	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.9	0.9			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	98.21624		108.34	mg/L	110.3	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	98.21624	16.2	125.2	mg/L	111	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	98.21624	16.2	124.55	mg/L	110.3	85	115	0.52	20	

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65088***

Sulfate 375.4 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233166													
WG233166ICB	ICB	09/27/07 7:53				U	mg/L		-3	3			
WG233166ICV	ICV	09/27/07 7:53	WI070919-2	20.04		20.3	mg/L	101.3	90	110			
WG233166LFB2	LFB	09/27/07 8:39	WI070718-3	10		10	mg/L	100	90	110			
L65087-02AS	AS	09/27/07 8:51	WI070718-3	10	U	U	mg/L	0	90	110			M2
L65087-03DUP	DUP	09/27/07 9:01			U	U	mg/L				0	20	RA
WG233166LFB3	LFB	09/27/07 9:02	WI070718-3	10		9	mg/L	90	90	110			
WG233166ICB1	ICB	09/28/07 7:57				U	mg/L		-3	3			
WG233166ICV1	ICV	09/28/07 7:57	WI070919-2	20.04		20.6	mg/L	102.8	90	110			
WG233166LFB1	LFB	09/28/07 8:14	WI070718-3	10		9.7	mg/L	97	90	110			

SRK Consulting ACZ Project ID: ***L65088***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65088-01	WG232961	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L65088-02	WG232961	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

SRK Consulting ACZ Project ID: ***L65088***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65088-03	WG232961	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L65088-04	WG233029	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.
	WG232961	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG233015	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	DF	Sample required dilution due to high sediment.
			415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
			M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

SRK Consulting ACZ Project ID: ***L65088***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65088-05	WG233015	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
			M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Sulfate	375.4 - Turbidimetric

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L65088
Date Received: 9/18/2007
Received By:
Date Printed: 9/18/2007

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
1878	1.9	15

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L65088
Date Received: 9/18/2007
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L65088-01	BDLU-4	Y	Y		Y		Y					
L65088-02	SW313	Y	Y		Y		Y					
L65088-03	SW15	Y	Y		Y		Y					
L65088-04	SW04	Y	Y		Y		Y					
L65088-05	ER-1	Y	Y		Y		Y					

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH-Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc. L65088

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: LARRY COPE
Company: SRK CONSULTING
E-mail: lcope@srk.com
Address: 19 OLD TOWN SQ, STE 238 FORT COLLINS, CO 80524
Telephone: 970-407-8302 XT 12

Copy of Report to:

Name: N/A
Company:
E-mail:
Telephone:

Invoice to:

Name: PAM PINSON/ACCOUNTS PAYABLE
Company: PHELPS DODGE MINING CO
E-mail: pam.pinson@FMI.COM
Address: CHINO MINES CO, PO BOX 13308 PHOENIX, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [X] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: OG01XB
Reporting state for compliance testing: NM
Sampler's Name: MIKE SIEBER
Are any samples NRC licensable material? NO

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	WET CHEMISTRY RAW	WET CHEMISTRY DISSOLVED	METALS TOTAL	METALS DISSOLVED	DOC, WET CHEM DISSOLVED	COD-TOC RAW		
BDW-4	9/13/07 10:15	SW	6	X	X	X	X	X	X		
SW313	9/13/07 10:45	SW	6	X	X	X	X	X	X		
SW15	9/13/07 12:15	SW	6	X	X	X	X	X	X		
SW04	9/13/07 16:00	SW	6	X	X	X	X	X	X		
ER-1	9/13/07 17:00	SW	6	X	X	X	X	X	X		

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE 1 of 1

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
[illegible]	9/17/07 10:00	WPC	9-18-07 9:53

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

October 01, 2007

Report to:
Larry Cope
SRK Consulting
19 Old Twon Square Suite 238
Fort Coliins, CO 80524

Bill to:
Pam Pinson
Phelps Dodge Mining Company
Chino Mines Company PO Box 7
Hurley, NM 88043

Project ID: OG01XB
ACZ Project ID: L65006

Larry Cope:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on September 13, 2007. This project has been assigned to ACZ's project number, L65006. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L65006. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 01, 2007. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl 05/Oct/07

Scott Habermehl, Project Manager, has reviewed and approved this report in its entirety.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW01

ACZ Sample ID: ***L65006-01***
Date Sampled: *09/11/07 10:30*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 13:43	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 13:20	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:00	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.477		*	mg/L	0.001	0.005	09/19/07 5:03	msh
Aluminum, total	M200.8 ICP-MS	2.110		*	mg/L	0.005	0.03	09/19/07 13:41	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:03	msh
Cadmium, total	M200.8 ICP-MS	0.0001	B		mg/L	0.0001	0.0005	09/18/07 9:56	jjr
Calcium, dissolved	M200.7 ICP	11.0			mg/L	0.2	1	09/21/07 0:37	djt
Copper, dissolved	M200.8 ICP-MS	0.0193			mg/L	0.0005	0.003	09/19/07 5:03	msh
Copper, total	M200.8 ICP-MS	0.0194			mg/L	0.0005	0.003	09/18/07 9:56	jjr
Iron, dissolved	M200.7 ICP	0.15			mg/L	0.02	0.05	09/21/07 0:37	djt
Iron, total	M200.7 ICP	1.27		*	mg/L	0.02	0.05	09/22/07 4:33	erf
Lead, dissolved	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/19/07 5:03	msh
Lead, total	M200.8 ICP-MS	0.0007			mg/L	0.0001	0.0005	09/18/07 9:56	jjr
Magnesium, dissolved	M200.7 ICP	4.5			mg/L	0.2	1	09/21/07 0:37	djt
Manganese, dissolved	M200.8 ICP-MS	0.0085		*	mg/L	0.0005	0.003	09/19/07 5:03	msh
Manganese, total	M200.8 ICP-MS	0.0105			mg/L	0.0005	0.003	09/18/07 9:56	jjr
Potassium, dissolved	M200.7 ICP	1.9	B		mg/L	0.3	2	09/25/07 19:07	erf
Sodium, dissolved	M200.7 ICP	8.4			mg/L	0.3	2	09/21/07 0:37	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW01

ACZ Sample ID: ***L65006-01***
Date Sampled: *09/11/07 10:30*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		26			mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		26			mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	12		*	mg/L	1	5	09/20/07 21:08	jag
Carbon, total organic (TOC)	415.1 / SM5310B	11		*	mg/L	1	5	09/22/07 0:10	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		47.4			%			10/01/07 0:00	calc
Sum of Anions		0.5			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		1.4			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/20/07 14:41	mls\
Hardness as CaCO3	SM2340B - Calculation	46			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/21/07 21:56	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.04	B	*	mg/L	0.01	0.05	09/25/07 16:42	mls
Sulfate	375.4 - Turbidimetric	1	B	*	mg/L	1	5	09/24/07 11:29	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW02

ACZ Sample ID: ***L65006-02***
Date Sampled: *09/11/07 11:45*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 13:48	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 13:33	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:10	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.112		*	mg/L	0.001	0.005	09/19/07 5:09	msh
Aluminum, total	M200.8 ICP-MS	0.742		*	mg/L	0.001	0.005	09/18/07 10:02	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:09	msh
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/18/07 10:02	jjr
Calcium, dissolved	M200.7 ICP	16.8			mg/L	0.2	1	09/21/07 0:41	djt
Copper, dissolved	M200.8 ICP-MS	0.0139			mg/L	0.0005	0.003	09/19/07 5:09	msh
Copper, total	M200.8 ICP-MS	0.0140			mg/L	0.0005	0.003	09/18/07 10:02	jjr
Iron, dissolved	M200.7 ICP	0.09			mg/L	0.02	0.05	09/21/07 0:41	djt
Iron, total	M200.7 ICP	0.51		*	mg/L	0.02	0.05	09/22/07 4:37	erf
Lead, dissolved	M200.8 ICP-MS	0.0002	B		mg/L	0.0001	0.0005	09/19/07 5:09	msh
Lead, total	M200.8 ICP-MS	0.0004	B		mg/L	0.0001	0.0005	09/18/07 10:02	jjr
Magnesium, dissolved	M200.7 ICP	5.1			mg/L	0.2	1	09/21/07 0:41	djt
Manganese, dissolved	M200.8 ICP-MS	0.0350		*	mg/L	0.0005	0.003	09/19/07 5:09	msh
Manganese, total	M200.8 ICP-MS	0.0343			mg/L	0.0005	0.003	09/18/07 10:02	jjr
Potassium, dissolved	M200.7 ICP	2.7			mg/L	0.3	2	09/25/07 19:19	erf
Sodium, dissolved	M200.7 ICP	13.3			mg/L	0.3	2	09/21/07 0:41	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW02

ACZ Sample ID: ***L65006-02***
Date Sampled: *09/11/07 11:45*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		40			mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		40			mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/20/07 21:37	jag
Carbon, total organic (TOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/22/07 0:25	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		26.7			%			10/01/07 0:00	calc
Sum of Anions		1.1			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		1.9			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/20/07 14:43	mls\
Hardness as CaCO3	SM2340B - Calculation	63			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/21/07 21:58	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.02	B	*	mg/L	0.01	0.05	09/25/07 16:43	mls
Sulfate	375.4 - Turbidimetric	13		*	mg/L	1	5	09/24/07 11:30	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW03

ACZ Sample ID: ***L65006-03***
Date Sampled: *09/11/07 12:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 13:54	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 13:47	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:20	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.081		*	mg/L	0.001	0.005	09/19/07 5:15	msh
Aluminum, total	M200.8 ICP-MS	0.384		*	mg/L	0.001	0.005	09/18/07 10:20	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:15	msh
Cadmium, total	M200.8 ICP-MS	0.0001	B		mg/L	0.0001	0.0005	09/18/07 10:20	jjr
Calcium, dissolved	M200.7 ICP	26.0			mg/L	0.2	1	09/21/07 0:45	djt
Copper, dissolved	M200.8 ICP-MS	0.0145			mg/L	0.0005	0.003	09/19/07 5:15	msh
Copper, total	M200.8 ICP-MS	0.0152			mg/L	0.0005	0.003	09/18/07 10:20	jjr
Iron, dissolved	M200.7 ICP	0.12			mg/L	0.02	0.05	09/21/07 0:45	djt
Iron, total	M200.7 ICP	0.38		*	mg/L	0.02	0.05	09/22/07 4:41	erf
Lead, dissolved	M200.8 ICP-MS	0.0005			mg/L	0.0001	0.0005	09/19/07 5:15	msh
Lead, total	M200.8 ICP-MS	0.0011			mg/L	0.0001	0.0005	09/18/07 10:20	jjr
Magnesium, dissolved	M200.7 ICP	7.3			mg/L	0.2	1	09/21/07 0:45	djt
Manganese, dissolved	M200.8 ICP-MS	0.0501		*	mg/L	0.0005	0.003	09/19/07 5:15	msh
Manganese, total	M200.8 ICP-MS	0.0511			mg/L	0.0005	0.003	09/18/07 10:20	jjr
Potassium, dissolved	M200.7 ICP	3.3			mg/L	0.3	2	09/25/07 19:23	erf
Sodium, dissolved	M200.7 ICP	18.4			mg/L	0.3	2	09/21/07 0:45	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW03

ACZ Sample ID: ***L65006-03***
Date Sampled: *09/11/07 12:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		58			mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		58			mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/20/07 22:05	jag
Carbon, total organic (TOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/22/07 0:39	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		19.1			%			10/01/07 0:00	calc
Sum of Anions		1.9			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		2.8			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/20/07 14:44	mls\
Hardness as CaCO3	SM2340B - Calculation	95			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/21/07 21:59	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.05	B	*	mg/L	0.01	0.05	09/25/07 16:44	mls
Sulfate	375.4 - Turbidimetric	32		*	mg/L	5	30	09/24/07 12:28	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW05

ACZ Sample ID: ***L65006-04***
Date Sampled: *09/11/07 15:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 15:55	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:30	jjr
Total Hot Plate Digestion	M200.2 ICP							09/20/07 14:01	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	11.20			mg/L	0.05	0.3	09/20/07 20:02	msh
Aluminum, total	M200.8 ICP-MS	11.90		*	mg/L	0.05	0.3	09/19/07 13:47	jjr
Cadmium, dissolved	M200.8 ICP-MS	0.0038			mg/L	0.0001	0.0005	09/19/07 5:21	msh
Cadmium, total	M200.8 ICP-MS	0.0040			mg/L	0.0001	0.0005	09/18/07 10:26	jjr
Calcium, dissolved	M200.7 ICP	69.2			mg/L	0.2	1	09/21/07 0:50	djt
Copper, dissolved	M200.8 ICP-MS	1.22			mg/L	0.03	0.1	09/20/07 20:02	msh
Copper, total	M200.8 ICP-MS	1.16			mg/L	0.03	0.1	09/19/07 13:47	jjr
Iron, dissolved	M200.7 ICP	0.18			mg/L	0.02	0.05	09/21/07 0:50	djt
Iron, total	M200.7 ICP	0.19		*	mg/L	0.02	0.05	09/22/07 4:45	erf
Lead, dissolved	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/19/07 5:21	msh
Lead, total	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/18/07 10:26	jjr
Magnesium, dissolved	M200.7 ICP	46.7			mg/L	0.2	1	09/21/07 0:50	djt
Manganese, dissolved	M200.8 ICP-MS	4.41			mg/L	0.03	0.1	09/20/07 20:02	msh
Manganese, total	M200.8 ICP-MS	4.64			mg/L	0.03	0.1	09/19/07 13:47	jjr
Potassium, dissolved	M200.7 ICP	4.1			mg/L	0.3	2	09/25/07 19:28	erf
Sodium, dissolved	M200.7 ICP	10.3			mg/L	0.3	2	09/21/07 0:50	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW05

ACZ Sample ID: ***L65006-04***
Date Sampled: *09/11/07 15:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity			U		mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/20/07 22:19	jag
Carbon, total organic (TOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/22/07 1:07	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		8.0			%			10/01/07 0:00	calc
Sum of Anions		8.0			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		9.4			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/20/07 14:45	mls\
Hardness as CaCO3	SM2340B - Calculation	365			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1.40		*	mg/L	0.02	0.1	09/21/07 22:00	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	09/25/07 18:12	mls
Sulfate	375.4 - Turbidimetric	380		*	mg/L	20	100	09/24/07 12:31	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW06A

ACZ Sample ID: ***L65006-05***
Date Sampled: *09/11/07 16:50*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 15:57	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 14:15	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:40	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.138		*	mg/L	0.001	0.005	09/19/07 5:27	msh
Aluminum, total	M200.8 ICP-MS	0.129		*	mg/L	0.001	0.005	09/18/07 10:32	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:27	msh
Cadmium, total	M200.8 ICP-MS	0.0001	B		mg/L	0.0001	0.0005	09/18/07 10:32	jjr
Calcium, dissolved	M200.7 ICP	5.9			mg/L	0.2	1	09/21/07 0:54	djt
Copper, dissolved	M200.8 ICP-MS	0.0301			mg/L	0.0005	0.003	09/19/07 5:27	msh
Copper, total	M200.8 ICP-MS	0.0278			mg/L	0.0005	0.003	09/18/07 10:32	jjr
Iron, dissolved	M200.7 ICP	0.05	B		mg/L	0.02	0.05	09/21/07 0:54	djt
Iron, total	M200.7 ICP	0.06		*	mg/L	0.02	0.05	09/22/07 4:50	erf
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:27	msh
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/18/07 10:32	jjr
Magnesium, dissolved	M200.7 ICP	2.6			mg/L	0.2	1	09/21/07 0:54	djt
Manganese, dissolved	M200.8 ICP-MS	0.0133		*	mg/L	0.0005	0.003	09/19/07 5:27	msh
Manganese, total	M200.8 ICP-MS	0.0037			mg/L	0.0005	0.003	09/18/07 10:32	jjr
Potassium, dissolved	M200.7 ICP	2.1			mg/L	0.3	2	09/25/07 19:40	erf
Sodium, dissolved	M200.7 ICP	3.9			mg/L	0.3	2	09/21/07 0:54	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW06A

ACZ Sample ID: ***L65006-05***
Date Sampled: *09/11/07 16:50*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		5	B		mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		5	B		mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	13		*	mg/L	1	5	09/20/07 23:02	jag
Carbon, total organic (TOC)	415.1 / SM5310B	13		*	mg/L	1	5	09/22/07 1:21	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		n/a			%			10/01/07 0:00	calc
Sum of Anions		0.1	B		meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		0.7			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	1	B	*	mg/L	1	5	09/20/07 14:46	mls\
Hardness as CaCO3	SM2340B - Calculation	25			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/21/07 22:01	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.01	B	*	mg/L	0.01	0.05	09/25/07 18:13	mls
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/24/07 11:23	jlf

** Please refer to Qualifier Reports for details.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

Phelps Dodge Mining Company
Project ID: OG01XB

ACZ Project ID: ***L65006***

Alkalinity as CaCO3 SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232679													
WG232679PBW1	PBW	09/20/07 9:04				U	mg/L		-20	20			
WG232679LCSW2	LCSW	09/20/07 9:17	WC070917-1	820		828.4	mg/L	101	90	110			
WG232679PBW2	PBW	09/20/07 12:17				U	mg/L		-20	20			
WG232679LCSW5	LCSW	09/20/07 12:30	WC070917-1	820		835.9	mg/L	101.9	90	110			
WG232679PBW3	PBW	09/20/07 15:17				U	mg/L		-20	20			
WG232679LCSW8	LCSW	09/20/07 15:29	WC070917-1	820		841.1	mg/L	102.6	90	110			
L65006-01DUP	DUP	09/20/07 17:04			26	25.9	mg/L				0.4	20	
L65008-04DUP	DUP	09/20/07 18:26			269	269.7	mg/L				0.3	20	
WG232679PBW4	PBW	09/20/07 18:31				U	mg/L		-20	20			
WG232679LCSW11	LCSW	09/20/07 18:43	WC070917-1	820		844.5	mg/L	103	90	110			
WG232679LCSW14	LCSW	09/20/07 21:58	WC070917-1	820		847.4	mg/L	103.3	90	110			

Aluminum, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232542													
WG232542ICV	ICV	09/19/07 2:29	MS070913-2	.1		.1028	mg/L	102.8	90	110			
WG232542ICB	ICB	09/19/07 2:35				U	mg/L		-0.003	0.003			
WG232542LFB	LFB	09/19/07 2:47	MS070917-3	.05		.0522	mg/L	104.4	85	115			
L64994-01AS	AS	09/19/07 4:22	MS070917-3	.05	.535	.6643	mg/L	258.6	70	130			M3
L64994-01ASD	ASD	09/19/07 4:28	MS070917-3	.05	.535	.6622	mg/L	254.4	70	130	0.32	20	M3
WG232624													
WG232624ICV	ICV	09/20/07 16:59	MS070913-2	.1		.1019	mg/L	101.9	90	110			
WG232624ICB	ICB	09/20/07 17:04				U	mg/L		-0.003	0.003			
WG232624LFB	LFB	09/20/07 17:16	MS070917-3	.05		.0502	mg/L	100.4	85	115			
L64946-08AS	AS	09/20/07 18:51	MS070917-3	.05	.006	.0557	mg/L	99.4	70	130			
L64946-08ASD	ASD	09/20/07 18:57	MS070917-3	.05	.006	.0564	mg/L	100.8	70	130	1.25	20	

Aluminum, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232466													
WG232466ICV	ICV	09/18/07 7:47	MS070828-4	.1		.1068	mg/L	106.8	90	110			
WG232466ICB	ICB	09/18/07 7:53				U	mg/L		-0.003	0.003			
WG232415LRB	LRB	09/18/07 7:59				.0084	mg/L		-0.0022	0.0022			B7
WG232415LFB	LFB	09/18/07 8:04	MS070828-5	.05		.0529	mg/L	105.8	85	115			
L64997-07LFM	LFM	09/18/07 9:32	MS070828-5	.05	.011	.0634	mg/L	104.8	70	130			
L64997-07LFMD	LFMD	09/18/07 9:38	MS070828-5	.05	.011	.0744	mg/L	126.8	70	130	15.97	20	
WG232560													
WG232560ICV	ICV	09/19/07 10:30	MS070913-2	.1		.1049	mg/L	104.9	90	110			
WG232560ICB	ICB	09/19/07 10:35				U	mg/L		-0.003	0.003			
WG232165LRB	LRB	09/19/07 10:41				.0014	mg/L		-0.0022	0.0022			
WG232165LFB	LFB	09/19/07 10:47	MS070828-5	.05		.0545	mg/L	109	85	115			
L64977-03LFM	LFM	09/19/07 11:32	MS070828-5	.05	.015	.0627	mg/L	95.4	70	130			
L64977-03LFMD	LFMD	09/19/07 11:48	MS070828-5	.05	.015	.0639	mg/L	97.8	70	130	1.9	20	
WG232415LRB	LRB	09/19/07 12:40				.0074	mg/L		-0.0022	0.0022			B7
WG232415LFB	LFB	09/19/07 12:57	MS070828-5	.05		.0563	mg/L	112.6	85	115			
L64997-07LFM	LFM	09/19/07 13:30	MS070828-5	.05	.006	.0622	mg/L	112.4	70	130			
L64997-07LFMD	LFMD	09/19/07 13:36	MS070828-5	.05	.006	.0632	mg/L	114.4	70	130	1.59	20	

Phelps Dodge Mining Company
Project ID: OG01XB

ACZ Project ID: ***L65006***

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232542													
WG232542ICV	ICV	09/19/07 2:29	MS070913-2	.05		.05069	mg/L	101.4	90	110			
WG232542ICB	ICB	09/19/07 2:35				U	mg/L		-0.0003	0.0003			
WG232542LFB	LFB	09/19/07 2:47	MS070917-3	.05		.05154	mg/L	103.1	85	115			
L64994-01AS	AS	09/19/07 4:22	MS070917-3	.05	U	.04633	mg/L	92.7	70	130			
L64994-01ASD	ASD	09/19/07 4:28	MS070917-3	.05	U	.04667	mg/L	93.3	70	130	0.73	20	

Cadmium, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232466													
WG232466ICV	ICV	09/18/07 7:47	MS070828-4	.05		.05334	mg/L	106.7	90	110			
WG232466ICB	ICB	09/18/07 7:53				U	mg/L		-0.0003	0.0003			
WG232415LRB	LRB	09/18/07 7:59				U	mg/L		-0.00022	0.00022			
WG232415LFB	LFB	09/18/07 8:04	MS070828-5	.05		.05243	mg/L	104.9	85	115			
L64997-07LFM	LFM	09/18/07 9:32	MS070828-5	.05	.0049	.05467	mg/L	99.5	70	130			
L64997-07LFMD	LFMD	09/18/07 9:38	MS070828-5	.05	.0049	.05384	mg/L	97.9	70	130	1.53	20	

Calcium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232754													
WG232754ICV	ICV	09/20/07 22:39	II070911-1	100		98.32	mg/L	98.3	95	105			
WG232754ICB	ICB	09/20/07 22:43				U	mg/L		-0.6	0.6			
WG232754LFB	LFB	09/20/07 23:00	II070916-4	67.97008		71.49	mg/L	105.2	85	115			
L64992-05AS	AS	09/21/07 0:03	II070916-4	67.97008	59.5	128.44	mg/L	101.4	85	115			
L64992-05ASD	ASD	09/21/07 0:08	II070916-4	67.97008	59.5	129.88	mg/L	103.5	85	115	1.11	20	

Carbon, dissolved organic (DOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232755													
WG232755ICV	ICV	09/20/07 16:52	WI070822-1	75		69.6	mg/L	92.8	90	110			
WG232755ICB	ICB	09/20/07 17:06				U	mg/L		-3	3			
L65006-01AS	AS	09/20/07 21:22	WI070918-1	50	12	58.8	mg/L	93.6	90	110			
L65006-02DUP	DUP	09/20/07 21:51			8	9	mg/L				11.8	20	RA
WG232755LFB2	LFB	09/20/07 23:59	WI070918-1	50		46.6	mg/L	93.2	90	110			
WG232755LFB1	LFB	09/21/07 12:20	WI070918-1	50		46.4	mg/L	92.8	90	110			

Carbon, total organic (TOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232788													
WG232788ICV	ICV	09/21/07 17:32	WI070822-1	75		69.9	mg/L	93.2	90	110			
WG232788ICB	ICB	09/21/07 17:46				U	mg/L		-3	3			
WG232788LFB1	LFB	09/21/07 18:01	WI070918-1	50		49.5	mg/L	99	90	110			
L64978-01AS	AS	09/21/07 22:31	WI070918-1	50	2	49.1	mg/L	94.2	90	110			
L64978-02DUP	DUP	09/21/07 22:59			3	3.1	mg/L				3.3	20	RA
WG232788LFB2	LFB	09/22/07 0:53	WI070918-1	50		47.3	mg/L	94.6	90	110			
L65006-05AS	AS	09/22/07 1:36	WI070918-1	50	13	61.2	mg/L	96.4	90	110			
L65009-11DUP	DUP	09/22/07 2:33			6	5	mg/L				18.2	20	RA

Phelps Dodge Mining Company
Project ID: OG01XB

ACZ Project ID: ***L65006***

Chloride 325.2 / SM4500Cl-E

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232707													
WG232707ICV	ICV	09/20/07 11:35	WI070314-1	55		56.2	mg/L	102.2	90	110			
WG232707ICB	ICB	09/20/07 11:36				U	mg/L		-3	3			
WG232733													
WG232733ICV	ICV	09/20/07 13:52	WI070314-1	55		53.3	mg/L	96.9	90	110			
WG232733ICB	ICB	09/20/07 13:53				U	mg/L		-3	3			
WG232733LFB1	LFB	09/20/07 13:54	WI070712-1	30		29.4	mg/L	98	90	110			
WG232733LFB2	LFB	09/20/07 14:23	WI070712-1	30		28.6	mg/L	95.3	90	110			
L65005-07AS	AS	09/20/07 14:38	WI070712-1	30	3	33.2	mg/L	100.7	90	110			
L65006-01DUP	DUP	09/20/07 14:42			2	2	mg/L				0	20	RA

Copper, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232542													
WG232542ICV	ICV	09/19/07 2:29	MS070913-2	.05		.05038	mg/L	100.8	90	110			
WG232542ICB	ICB	09/19/07 2:35				U	mg/L		-0.0015	0.0015			
WG232542LFB	LFB	09/19/07 2:47	MS070917-3	.05		.05097	mg/L	101.9	85	115			
L64994-01AS	AS	09/19/07 4:22	MS070917-3	.05	.0086	.05119	mg/L	85.2	70	130			
L64994-01ASD	ASD	09/19/07 4:28	MS070917-3	.05	.0086	.05171	mg/L	86.2	70	130	1.01	20	
WG232624													
WG232624ICV	ICV	09/20/07 16:59	MS070913-2	.05		.05093	mg/L	101.9	90	110			
WG232624ICB	ICB	09/20/07 17:04				U	mg/L		-0.0015	0.0015			
WG232624LFB	LFB	09/20/07 17:16	MS070917-3	.05		.05217	mg/L	104.3	85	115			
L64946-08AS	AS	09/20/07 18:51	MS070917-3	.05	U	.0488	mg/L	97.6	70	130			
L64946-08ASD	ASD	09/20/07 18:57	MS070917-3	.05	U	.04858	mg/L	97.2	70	130	0.45	20	

Copper, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232466													
WG232466ICV	ICV	09/18/07 7:47	MS070828-4	.05		.0513	mg/L	102.6	90	110			
WG232466ICB	ICB	09/18/07 7:53				U	mg/L		-0.0015	0.0015			
WG232415LRB	LRB	09/18/07 7:59				U	mg/L		-0.0011	0.0011			
WG232415LFB	LFB	09/18/07 8:04	MS070828-5	.05		.05123	mg/L	102.5	85	115			
L64997-07LFM	LFM	09/18/07 9:32	MS070828-5	.05	U	.04348	mg/L	87	70	130			
L64997-07LFMD	LFMD	09/18/07 9:38	MS070828-5	.05	U	.04386	mg/L	87.7	70	130	0.87	20	
WG232560													
WG232560ICV	ICV	09/19/07 10:30	MS070913-2	.05		.05314	mg/L	106.3	90	110			
WG232560ICB	ICB	09/19/07 10:35				U	mg/L		-0.0015	0.0015			
WG232165LRB	LRB	09/19/07 10:41				U	mg/L		-0.0011	0.0011			
WG232165LFB	LFB	09/19/07 10:47	MS070828-5	.05		.05436	mg/L	108.7	85	115			
L64977-03LFM	LFM	09/19/07 11:32	MS070828-5	.05	.0006	.05512	mg/L	109	70	130			
L64977-03LFMD	LFMD	09/19/07 11:48	MS070828-5	.05	.0006	.05622	mg/L	111.2	70	130	1.98	20	
WG232415LRB	LRB	09/19/07 12:40				U	mg/L		-0.0011	0.0011			
WG232415LFB	LFB	09/19/07 12:57	MS070828-5	.05		.05636	mg/L	112.7	85	115			
L64997-07LFM	LFM	09/19/07 13:30	MS070828-5	.05	U	.04587	mg/L	91.7	70	130			
L64997-07LFMD	LFMD	09/19/07 13:36	MS070828-5	.05	U	.04537	mg/L	90.7	70	130	1.1	20	

Phelps Dodge Mining Company
Project ID: OG01XB

ACZ Project ID: ***L65006***

Iron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232754													
WG232754ICV	ICV	09/20/07 22:39	II070911-1	2		1.998	mg/L	99.9	95	105			
WG232754ICB	ICB	09/20/07 22:43				U	mg/L		-0.06	0.06			
WG232754LFB	LFB	09/20/07 23:00	II070916-4	1		1.024	mg/L	102.4	85	115			
L64992-05AS	AS	09/21/07 0:03	II070916-4	1	.06	1.078	mg/L	101.8	85	115			
L64992-05ASD	ASD	09/21/07 0:08	II070916-4	1	.06	1.079	mg/L	101.9	85	115	0.09	20	

Iron, total M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232849													
WG232849ICV	ICV	09/22/07 3:30	II070907-1	2		1.955	mg/L	97.8	95	105			
WG232849ICB	ICB	09/22/07 3:34				U	mg/L		-0.06	0.06			
WG232696LRB	LRB	09/22/07 3:51				.034	mg/L		-0.044	0.044			
WG232696LFB	LFB	09/22/07 3:55	II070916-4	1		1.04	mg/L	104	85	115			
L64994-01LFM	LFM	09/22/07 4:03	II070916-4	1	13.9	18.702	mg/L	480.2	70	130			M3
L64994-01LFMD	LFMD	09/22/07 4:08	II070916-4	1	13.9	18.209	mg/L	430.9	70	130	2.67	20	M3

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232542													
WG232542ICV	ICV	09/19/07 2:29	MS070913-2	.05		.05101	mg/L	102	90	110			
WG232542ICB	ICB	09/19/07 2:35				.00013	mg/L		-0.0003	0.0003			
WG232542LFB	LFB	09/19/07 2:47	MS070917-3	.05		.05163	mg/L	103.3	85	115			
L64994-01AS	AS	09/19/07 4:22	MS070917-3	.05	.0015	.05167	mg/L	100.3	70	130			
L64994-01ASD	ASD	09/19/07 4:28	MS070917-3	.05	.0015	.05215	mg/L	101.3	70	130	0.92	20	

Lead, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232466													
WG232466ICV	ICV	09/18/07 7:47	MS070828-4	.05		.05389	mg/L	107.8	90	110			
WG232466ICB	ICB	09/18/07 7:53				U	mg/L		-0.0003	0.0003			
WG232415LRB	LRB	09/18/07 7:59				U	mg/L		-0.00022	0.00022			
WG232415LFB	LFB	09/18/07 8:04	MS070828-5	.05		.05308	mg/L	106.2	85	115			
L64997-07LFM	LFM	09/18/07 9:32	MS070828-5	.05	U	.05477	mg/L	109.5	70	130			
L64997-07LFMD	LFMD	09/18/07 9:38	MS070828-5	.05	U	.05509	mg/L	110.2	70	130	0.58	20	

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232754													
WG232754ICV	ICV	09/20/07 22:39	II070911-1	100		100.19	mg/L	100.2	95	105			
WG232754ICB	ICB	09/20/07 22:43				U	mg/L		-0.6	0.6			
WG232754LFB	LFB	09/20/07 23:00	II070916-4	54.96908		57.29	mg/L	104.2	85	115			
L64992-05AS	AS	09/21/07 0:03	II070916-4	54.96908	33	90.19	mg/L	104	85	115			
L64992-05ASD	ASD	09/21/07 0:08	II070916-4	54.96908	33	90.94	mg/L	105.4	85	115	0.83	20	

Phelps Dodge Mining Company
Project ID: OG01XB

ACZ Project ID: ***L65006***

Manganese, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232542													
WG232542ICV	ICV	09/19/07 2:29	MS070913-2	.05		.04965	mg/L	99.3	90	110			
WG232542ICB	ICB	09/19/07 2:35				U	mg/L		-0.0015	0.0015			
WG232542LFB	LFB	09/19/07 2:47	MS070917-3	.05		.05066	mg/L	101.3	85	115			
L64994-01AS	AS	09/19/07 4:22	MS070917-3	.05	1.8	1.825	mg/L	50	70	130			M3
L64994-01ASD	ASD	09/19/07 4:28	MS070917-3	.05	1.8	1.818	mg/L	36	70	130	0.38	20	M3
WG232624													
WG232624ICV	ICV	09/20/07 16:59	MS070913-2	.05		.05054	mg/L	101.1	90	110			
WG232624ICB	ICB	09/20/07 17:04				U	mg/L		-0.0015	0.0015			
WG232624LFB	LFB	09/20/07 17:16	MS070917-3	.05		.05104	mg/L	102.1	85	115			
L64946-08AS	AS	09/20/07 18:51	MS070917-3	.05	.0195	.06867	mg/L	98.3	70	130			
L64946-08ASD	ASD	09/20/07 18:57	MS070917-3	.05	.0195	.06838	mg/L	97.8	70	130	0.42	20	

Manganese, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232466													
WG232466ICV	ICV	09/18/07 7:47	MS070828-4	.05		.05358	mg/L	107.2	90	110			
WG232466ICB	ICB	09/18/07 7:53				U	mg/L		-0.0015	0.0015			
WG232415LRB	LRB	09/18/07 7:59				U	mg/L		-0.0011	0.0011			
WG232415LFB	LFB	09/18/07 8:04	MS070828-5	.05		.0523	mg/L	104.6	85	115			
L64997-07LFM	LFM	09/18/07 9:32	MS070828-5	.05	.0191	.07134	mg/L	104.5	70	130			
L64997-07LFMD	LFMD	09/18/07 9:38	MS070828-5	.05	.0191	.0711	mg/L	104	70	130	0.34	20	
WG232560													
WG232560ICV	ICV	09/19/07 10:30	MS070913-2	.05		.05273	mg/L	105.5	90	110			
WG232560ICB	ICB	09/19/07 10:35				U	mg/L		-0.0015	0.0015			
WG232165LRB	LRB	09/19/07 10:41				U	mg/L		-0.0011	0.0011			
WG232165LFB	LFB	09/19/07 10:47	MS070828-5	.05		.05212	mg/L	104.2	85	115			
L64977-03LFM	LFM	09/19/07 11:32	MS070828-5	.05	.0012	.05269	mg/L	103	70	130			
L64977-03LFMD	LFMD	09/19/07 11:48	MS070828-5	.05	.0012	.05415	mg/L	105.9	70	130	2.73	20	
WG232415LRB	LRB	09/19/07 12:40				U	mg/L		-0.0011	0.0011			
WG232415LFB	LFB	09/19/07 12:57	MS070828-5	.05		.05338	mg/L	106.8	85	115			
L64997-07LFM	LFM	09/19/07 13:30	MS070828-5	.05	.0212	.07496	mg/L	107.5	70	130			
L64997-07LFMD	LFMD	09/19/07 13:36	MS070828-5	.05	.0212	.0745	mg/L	106.6	70	130	0.62	20	

Nitrate/Nitrite as N M353.2 - H2SO4 preserved

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232853													
WG232853ICV	ICV	09/21/07 18:12	WI070911-1	2.416		2.432	mg/L	100.7	90	110			
WG232853ICB	ICB	09/21/07 18:13				U	mg/L		-0.06	0.06			
WG232859													
WG232859ICV	ICV	09/21/07 21:21	WI070911-1	2.416		2.45	mg/L	101.4	90	110			
WG232859ICB	ICB	09/21/07 21:22				U	mg/L		-0.06	0.06			
WG232859LFB	LFB	09/21/07 21:24	WI070911-4	2		2.055	mg/L	102.8	90	110			
L65005-02AS	AS	09/21/07 21:45	WI070911-4	2	.09	2.216	mg/L	106.3	90	110			
L65005-03DUP	DUP	09/21/07 21:47			U	.02	mg/L				0	20	RA

Phelps Dodge Mining Company
Project ID: OG01XB

ACZ Project ID: ***L65006***

Phosphorus, total M365.1 - Auto Ascorbic Acid (digest)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233005													
WG232887ICV	ICV	09/25/07 12:37	WI070329-1	.65228		.696	mg/L	106.7	90	110			
WG232887ICB	ICB	09/25/07 12:39				U	mg/L		-0.03	0.03			
WG233046													
WG232995ICV	ICV	09/25/07 16:09	WI070329-1	.65228		.707	mg/L	108.4	90	110			
WG232995ICB	ICB	09/25/07 16:11				U	mg/L		-0.03	0.03			
WG232995LRB	LRB	09/25/07 16:12				U	mg/L		-0.03	0.03			
L64996-03DUP	DUP	09/25/07 16:32			U	U	mg/L				0	20	RA
L64996-02LFM	LFM	09/25/07 16:47	WI070919-4	.5	U	.523	mg/L	104.6	90	110			
WG233046ICV1	ICV	09/26/07 13:00	WI070329-1	.65228		.675	mg/L	103.5	90	110			
WG233046ICB1	ICB	09/26/07 13:02				U	mg/L		-0.03	0.03			
WG232995LFB	LFB	09/26/07 13:03	WI070919-4	.5		.495	mg/L	99	90	110			
WG233062													
WG233020ICV	ICV	09/25/07 18:00	WI070329-1	.65228		.72	mg/L	110.4	90	110			
WG233020ICB	ICB	09/25/07 18:02				U	mg/L		-0.03	0.03			
WG233020LRB	LRB	09/25/07 18:03				U	mg/L		-0.03	0.03			
WG233020LFB	LFB	09/25/07 18:04	WI070919-4	.5		.482	mg/L	96.4	90	110			
L64873-01LFM	LFM	09/25/07 18:06	WI070919-4	.5	.04	.541	mg/L	100.2	90	110			
L65025-02DUP	DUP	09/25/07 18:25			.01	.016	mg/L				46.2	20	RA
L64873-02DUP	DUP	09/25/07 18:38			U	U	mg/L				0	20	RA
L65025-01LFM	LFM	09/25/07 18:44	WI070919-4	.5	.01	.466	mg/L	91.2	90	110			

Potassium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233002													
WG233002ICV	ICV	09/25/07 18:41	II070911-1	20		20.06	mg/L	100.3	95	105			
WG233002ICB	ICB	09/25/07 18:46				U	mg/L		-0.9	0.9			
WG233002LFB	LFB	09/25/07 19:02	II070920-4	99.76186		101.2	mg/L	101.4	85	115			
L65006-01AS	AS	09/25/07 19:11	II070920-4	99.76186	1.9	108.26	mg/L	106.6	85	115			
L65006-01ASD	ASD	09/25/07 19:15	II070920-4	99.76186	1.9	108.12	mg/L	106.5	85	115	0.13	20	

Sodium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232754													
WG232754ICV	ICV	09/20/07 22:39	II070911-1	100		102.77	mg/L	102.8	95	105			
WG232754ICB	ICB	09/20/07 22:43				U	mg/L		-0.9	0.9			
WG232754LFB	LFB	09/20/07 23:00	II070916-4	98.21624		104.49	mg/L	106.4	85	115			
L64992-05AS	AS	09/21/07 0:03	II070916-4	98.21624	11.3	118.78	mg/L	109.4	85	115			
L64992-05ASD	ASD	09/21/07 0:08	II070916-4	98.21624	11.3	119.25	mg/L	109.9	85	115	0.39	20	

Phelps Dodge Mining Company

Project ID: OG01XB

ACZ Project ID: ***L65006***

Sulfate 375.4 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232827													
WG232827ICB	ICB	09/24/07 10:27				U	mg/L		-3	3			
WG232827ICV	ICV	09/24/07 10:27	WI070919-2	20.04		20.4	mg/L	101.8	90	110			
WG232827LFB2	LFB	09/24/07 10:52	WI070718-3	10		9.2	mg/L	92	90	110			
WG232827LFB1	LFB	09/24/07 10:55	WI070718-3	10		9.3	mg/L	93	90	110			
WG232827LFB3	LFB	09/24/07 11:23	WI070718-3	10		9.2	mg/L	92	90	110			
L64994-04AS	AS	09/24/07 11:29	SO4TURB5	10	111	125.1	mg/L	141	90	110			M3
L65006-01DUP	DUP	09/24/07 11:29			1	1.5	mg/L				40	20	RA

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Phelps Dodge Mining Company ACZ Project ID: ***L65006***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65006-01	WG232542	Aluminum, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232560	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG232849	Iron, total	M200.7 ICP	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232542	Manganese, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232788	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232733	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232859	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233046	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232827	Sulfate	375.4 - Turbidimetric	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

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Inorganic Extended Qualifier Report

Phelps Dodge Mining Company ACZ Project ID: ***L65006***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65006-02	WG232542	Aluminum, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232466	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG232849	Iron, total	M200.7 ICP	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232542	Manganese, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232788	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232733	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232859	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233046	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232827	Sulfate	375.4 - Turbidimetric	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

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Inorganic Extended Qualifier Report

Phelps Dodge Mining Company ACZ Project ID: ***L65006***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65006-03	WG232542	Aluminum, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232466	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	BB	Target analyte detected in calibration blank at or above acceptance limit. Sample value was > 10X the concentration in the calibration blank.
	WG232849	Iron, total	M200.7 ICP	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232542	Manganese, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232788	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232733	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232859	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233046	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232827	Sulfate	375.4 - Turbidimetric	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

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Phelps Dodge Mining Company ACZ Project ID: ***L65006***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65006-04	WG232560	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG232849	Iron, total	M200.7 ICP	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232788	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232733	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232859	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233062	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232827	Sulfate	375.4 - Turbidimetric	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

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Phelps Dodge Mining Company ACZ Project ID: ***L65006***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65006-05	WG232542	Aluminum, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232466	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	BB	Target analyte detected in calibration blank at or above acceptance limit. Sample value was > 10X the concentration in the calibration blank.
	WG232849	Iron, total	M200.7 ICP	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232542	Manganese, dissolved	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232788	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232733	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232859	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233062	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232827	Sulfate	375.4 - Turbidimetric	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Sulfate	375.4 - Turbidimetric

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Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID:	L65006
Date Received:	9/13/2007
Received By:	
Date Printed:	9/13/2007

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
1264	5.5	17

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

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2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L65006
Date Received: 9/13/2007
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L65006-01	SW01	Y	Y			Y	Y					
L65006-02	SW02	Y	Y			Y	Y					
L65006-03	SW03	Y	Y			Y	Y					
L65006-04	SW05	Y	Y			Y	Y					
L65006-05	SW06A	Y	Y			Y	Y					

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH-Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc. L65006

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: [redacted] LARRY COPE
Company: SRK CONSULTING
E-mail: lcope@SRK.COM
Address: 19 OLD TOWN SQ, SUITE 238
Fort Collins, CO 80524
Telephone: 970-407-8302 EXT 12

Copy of Report to:

Name: N/A
Company:
E-mail:
Telephone:

Invoice to:

Name: PAM PINSON/ACCOUNTS PAYABLE
Company: Phelps DODGE Mining Co.
E-mail: PAM.PINSON@FMI.COM
Address: Chino Mines Co. PO BOX 13308
Phoenix, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

YES: X
NO:

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: 0G01XB
Reporting state for compliance testing: NM
Sampler's Name: Mike Sieber
Are any samples NRC licensable material? NO

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	WET CHEMISTRY-RAW	WET CHEMISTRY-DISSOLVED	METALS RAW/NITRIC	METAL DISSOLVED FILTER/NITRIC	DOC WET CHEMISTRY	COD, TOC-RAW SULFURIC		
SW01	9.11.07 10:30	GW	6	X	X	X	X	X	X		
SW02	9.11.07 11:45	GW	6	X	X	X	X	X	X		
SW03	9.11.07 12:15	GW	6	X	X	X	X	X	X		
SW05	9.11.07 15:15	GW	6	X	X	X	X	X	X		
SW06A	9.11.07 16:50	W	6	X	X	X	X	X	X		

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
[signature]	9/12/07 0718	KU	9-13-07 12:07

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

October 05, 2007

Report to:
Larry Cope
SRK Consulting
19 Old Twon Square Suite 238
Fort Coliins, CO 80524

Bill to:
Accounts Payable Dept
Phelps Dodge Mining Company
Chino Mines Company PO Box 13308
Phoenix, AZ 85002-3308

Project ID: OG01XB
ACZ Project ID: L65029

Larry Cope:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on September 14, 2007. This project has been assigned to ACZ's project number, L65029. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L65029. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 05, 2007. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl 05/Oct/07

Scott Habermehl, Project Manager, has reviewed and approved this report in its entirety.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Case Narrative

SRK Consulting

October 05, 2007

Project ID: OG01XB
ACZ Project ID: L65029

Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 6 miscellaneous samples from Phelps Dodge Mining Company on September 14, 2007. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L65029. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

Samples were received outside the EPA recommended temperature of 0-6 degrees C.

Holding Times

All analyses were performed within EPA recommended holding times.

Sample Analysis

These samples were analyzed for inorganic parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The extended qualifier reports may contain footnotes qualifying specific elements due to QC failures.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: CDW-1

ACZ Sample ID: ***L65029-01***
Date Sampled: *09/12/07 08:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 16:48	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 14:57	jjr
Total Hot Plate Digestion	M200.2 ICP							09/28/07 17:21	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.052			mg/L	0.001	0.005	09/22/07 13:18	scp
Aluminum, total	M200.8 ICP-MS	0.076		*	mg/L	0.001	0.005	09/19/07 6:38	jjr
Cadmium, dissolved	M200.8 ICP-MS	0.0013			mg/L	0.0001	0.0005	09/22/07 13:18	scp
Cadmium, total	M200.8 ICP-MS	0.0013			mg/L	0.0001	0.0005	09/19/07 6:38	jjr
Calcium, dissolved	M200.7 ICP	10.2			mg/L	0.2	1	09/22/07 2:59	dtt
Copper, dissolved	M200.8 ICP-MS	0.2210			mg/L	0.0005	0.003	09/22/07 13:18	scp
Copper, total	M200.8 ICP-MS	0.2390			mg/L	0.0005	0.003	09/19/07 6:38	jjr
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/22/07 2:59	dtt
Iron, total	M200.7 ICP	0.04	B		mg/L	0.02	0.05	09/30/07 16:39	erf
Lead, dissolved	M200.8 ICP-MS	0.0002	B		mg/L	0.0001	0.0005	09/22/07 13:18	scp
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 6:38	jjr
Magnesium, dissolved	M200.7 ICP	2.4			mg/L	0.2	1	09/22/07 2:59	dtt
Manganese, dissolved	M200.8 ICP-MS	0.0931			mg/L	0.0005	0.003	09/22/07 13:18	scp
Manganese, total	M200.8 ICP-MS	0.0944			mg/L	0.0005	0.003	09/19/07 6:38	jjr
Potassium, dissolved	M200.7 ICP	2.8		*	mg/L	0.3	2	09/23/07 20:44	erf
Sodium, dissolved	M200.7 ICP	6.8			mg/L	0.3	2	09/22/07 2:59	dtt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: CDW-1

ACZ Sample ID: ***L65029-01***
Date Sampled: *09/12/07 08:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity			U		mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	3	B	*	mg/L	1	5	09/21/07 0:27	jag
Carbon, total organic (TOC)	415.1 / SM5310B	3	B	*	mg/L	1	5	09/24/07 18:57	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		4.8			%			10/05/07 0:00	calc
Sum of Anions		1.0			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 14:49	jlf
Hardness as CaCO3	SM2340B - Calculation	35			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.06	B		mg/L	0.02	0.1	09/26/07 21:13	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	09/25/07 18:36	mls
Sulfate	375.4 - Turbidimetric	47		*	mg/L	5	30	09/28/07 8:24	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW12

ACZ Sample ID: ***L65029-02***
Date Sampled: *09/12/07 10:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:01	pjb
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 17:57	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:07	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.139			mg/L	0.001	0.005	09/22/07 13:24	scp
Aluminum, total	M200.8 ICP-MS	10.00		*	mg/L	0.02	0.1	09/20/07 22:05	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:24	scp
Cadmium, total	M200.8 ICP-MS	0.0002	B		mg/L	0.0001	0.0005	09/19/07 6:43	jjr
Calcium, dissolved	M200.7 ICP	18.5			mg/L	0.2	1	09/22/07 3:03	dtt
Copper, dissolved	M200.8 ICP-MS	0.0458			mg/L	0.0005	0.003	09/22/07 13:24	scp
Copper, total	M200.8 ICP-MS	0.1880			mg/L	0.0005	0.003	09/19/07 6:43	jjr
Iron, dissolved	M200.7 ICP	0.17			mg/L	0.02	0.05	09/22/07 3:03	dtt
Iron, total	M200.7 ICP	10.60			mg/L	0.04	0.1	09/30/07 16:52	erf
Lead, dissolved	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/22/07 13:24	scp
Lead, total	M200.8 ICP-MS	0.0061			mg/L	0.0001	0.0005	09/19/07 6:43	jjr
Magnesium, dissolved	M200.7 ICP	1.9			mg/L	0.2	1	09/22/07 3:03	dtt
Manganese, dissolved	M200.8 ICP-MS	0.0265			mg/L	0.0005	0.003	09/22/07 13:24	scp
Manganese, total	M200.8 ICP-MS	0.1150			mg/L	0.0005	0.003	09/19/07 6:43	jjr
Potassium, dissolved	M200.7 ICP	9.7		*	mg/L	0.3	2	09/23/07 20:48	erf
Sodium, dissolved	M200.7 ICP	0.5	B		mg/L	0.3	2	09/22/07 3:03	dtt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW12

ACZ Sample ID: ***L65029-02***
Date Sampled: *09/12/07 10:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		56			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		56			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/20/07 23:16	jag
Carbon, total organic (TOC)	415.1 / SM5310B	11	B	*	mg/L	3	20	09/24/07 19:26	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		8.3			%			10/05/07 0:00	calc
Sum of Anions		1.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.3			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 14:49	jlf
Hardness as CaCO3	SM2340B - Calculation	54			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.64			mg/L	0.02	0.1	09/26/07 21:18	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.42			mg/L	0.01	0.05	10/03/07 13:13	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/28/07 8:22	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW312

ACZ Sample ID: ***L65029-03***
Date Sampled: *09/12/07 10:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:09	pjb
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:36	jjr
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:09	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.128			mg/L	0.001	0.005	09/22/07 13:29	scp
Aluminum, total	M200.8 ICP-MS	11.50		*	mg/L	0.05	0.3	09/20/07 22:20	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:29	scp
Cadmium, total	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/19/07 7:07	jjr
Calcium, dissolved	M200.7 ICP	18.3			mg/L	0.2	1	09/22/07 3:07	dtt
Copper, dissolved	M200.8 ICP-MS	0.0449			mg/L	0.0005	0.003	09/22/07 13:29	scp
Copper, total	M200.8 ICP-MS	0.1950			mg/L	0.0005	0.003	09/19/07 7:07	jjr
Iron, dissolved	M200.7 ICP	0.15			mg/L	0.02	0.05	09/22/07 3:07	dtt
Iron, total	M200.7 ICP	10.40			mg/L	0.04	0.1	09/30/07 17:04	erf
Lead, dissolved	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/22/07 13:29	scp
Lead, total	M200.8 ICP-MS	0.0064			mg/L	0.0001	0.0005	09/19/07 7:07	jjr
Magnesium, dissolved	M200.7 ICP	1.9			mg/L	0.2	1	09/22/07 3:07	dtt
Manganese, dissolved	M200.8 ICP-MS	0.0295			mg/L	0.0005	0.003	09/22/07 13:29	scp
Manganese, total	M200.8 ICP-MS	0.1270			mg/L	0.0005	0.003	09/19/07 7:07	jjr
Potassium, dissolved	M200.7 ICP	9.8		*	mg/L	0.3	2	09/23/07 20:52	erf
Sodium, dissolved	M200.7 ICP	0.5	B		mg/L	0.3	2	09/22/07 3:07	dtt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW312

ACZ Sample ID: ***L65029-03***
Date Sampled: *09/12/07 10:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		56			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		56			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	7		*	mg/L	1	5	09/20/07 23:30	jag
Carbon, total organic (TOC)	415.1 / SM5310B	8	B	*	mg/L	2	10	09/24/07 20:23	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		4.0			%			10/05/07 0:00	calc
Sum of Anions		1.2			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.3			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/24/07 14:59	jlf
Hardness as CaCO3	SM2340B - Calculation	54			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.65			mg/L	0.02	0.1	09/26/07 21:20	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.42			mg/L	0.01	0.05	10/03/07 12:44	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/28/07 8:22	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW11

ACZ Sample ID: ***L65029-04***
Date Sampled: *09/12/07 11:15*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:17	pjb
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:21	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:45	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.186			mg/L	0.001	0.005	09/22/07 13:35	scp
Aluminum, total	M200.8 ICP-MS	20.20		*	mg/L	0.05	0.3	09/20/07 22:25	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:35	scp
Cadmium, total	M200.8 ICP-MS	0.0004	B		mg/L	0.0001	0.0005	09/19/07 7:12	jjr
Calcium, dissolved	M200.7 ICP	13.8			mg/L	0.2	1	09/22/07 3:11	dtt
Copper, dissolved	M200.8 ICP-MS	0.0397			mg/L	0.0005	0.003	09/22/07 13:35	scp
Copper, total	M200.8 ICP-MS	0.2100			mg/L	0.0005	0.003	09/19/07 7:12	jjr
Iron, dissolved	M200.7 ICP	0.11			mg/L	0.02	0.05	09/22/07 3:11	dtt
Iron, total	M200.7 ICP	15.50			mg/L	0.04	0.1	09/30/07 17:08	erf
Lead, dissolved	M200.8 ICP-MS	0.0001	B		mg/L	0.0001	0.0005	09/22/07 13:35	scp
Lead, total	M200.8 ICP-MS	0.0086			mg/L	0.0001	0.0005	09/19/07 7:12	jjr
Magnesium, dissolved	M200.7 ICP	1.8			mg/L	0.2	1	09/22/07 3:11	dtt
Manganese, dissolved	M200.8 ICP-MS	0.0326			mg/L	0.0005	0.003	09/22/07 13:35	scp
Manganese, total	M200.8 ICP-MS	0.1830			mg/L	0.0005	0.003	09/19/07 7:12	jjr
Potassium, dissolved	M200.7 ICP	8.2		*	mg/L	0.3	2	09/23/07 20:56	erf
Sodium, dissolved	M200.7 ICP	0.7	B		mg/L	0.3	2	09/22/07 3:11	dtt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW11

ACZ Sample ID: ***L65029-04***
Date Sampled: *09/12/07 11:15*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		42			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		42			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/20/07 23:44	jag
Carbon, total organic (TOC)	415.1 / SM5310B	8	B	*	mg/L	2	10	09/24/07 20:37	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		15.8			%			10/05/07 0:00	calc
Sum of Anions		0.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 15:00	jlf
Hardness as CaCO3	SM2340B - Calculation	42			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.68			mg/L	0.02	0.1	09/26/07 21:21	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.62			mg/L	0.01	0.05	10/03/07 12:46	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/28/07 8:22	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW13

ACZ Sample ID: ***L65029-05***
Date Sampled: *09/12/07 12:15*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:21	pjb
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:33	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:55	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.075			mg/L	0.001	0.005	09/22/07 13:41	scp
Aluminum, total	M200.8 ICP-MS	21.80		*	mg/L	0.05	0.3	09/20/07 22:30	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:41	scp
Cadmium, total	M200.8 ICP-MS	0.0005	B		mg/L	0.0001	0.0005	09/19/07 7:16	jjr
Calcium, dissolved	M200.7 ICP	25.5			mg/L	0.2	1	09/26/07 3:07	djt
Copper, dissolved	M200.8 ICP-MS	0.0456			mg/L	0.0005	0.003	09/22/07 13:41	scp
Copper, total	M200.8 ICP-MS	0.2530			mg/L	0.0005	0.003	09/19/07 7:16	jjr
Iron, dissolved	M200.7 ICP	0.03	B		mg/L	0.02	0.05	09/27/07 2:45	djt
Iron, total	M200.7 ICP	17.30			mg/L	0.04	0.1	09/30/07 17:13	erf
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:41	scp
Lead, total	M200.8 ICP-MS	0.0105			mg/L	0.0001	0.0005	09/19/07 7:16	jjr
Magnesium, dissolved	M200.7 ICP	2.6			mg/L	0.2	1	09/26/07 3:07	djt
Manganese, dissolved	M200.8 ICP-MS	0.0115			mg/L	0.0005	0.003	09/22/07 13:41	scp
Manganese, total	M200.8 ICP-MS	0.23			mg/L	0.03	0.1	09/22/07 1:23	scp
Potassium, dissolved	M200.7 ICP	9.1			mg/L	0.3	2	09/26/07 3:07	djt
Sodium, dissolved	M200.7 ICP	0.5	B		mg/L	0.3	2	09/27/07 2:45	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW13

ACZ Sample ID: ***L65029-05***
Date Sampled: *09/12/07 12:15*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		48			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		48			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/21/07 0:13	jag
Carbon, total organic (TOC)	415.1 / SM5310B	7	B	*	mg/L	2	10	09/24/07 20:51	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		25.9			%			10/05/07 0:00	calc
Sum of Anions		1.0			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.7			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 15:00	jlf
Hardness as CaCO3	SM2340B - Calculation	74			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1.95		*	mg/L	0.02	0.1	09/26/07 21:22	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.58			mg/L	0.01	0.05	10/03/07 12:48	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/28/07 8:22	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW14

ACZ Sample ID: ***L65029-06***
Date Sampled: *09/12/07 15:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:25	pjb
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 16:04	jjr
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:45	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.299			mg/L	0.001	0.005	09/22/07 13:58	scp
Aluminum, total	M200.8 ICP-MS	2.49		*	mg/L	0.02	0.1	09/20/07 22:35	scp
Cadmium, dissolved	M200.8 ICP-MS	0.0001	B		mg/L	0.0001	0.0005	09/22/07 13:58	scp
Cadmium, total	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/19/07 7:21	jjr
Calcium, dissolved	M200.7 ICP	7.3			mg/L	0.2	1	09/26/07 3:12	djt
Copper, dissolved	M200.8 ICP-MS	0.0487			mg/L	0.0005	0.003	09/22/07 13:58	scp
Copper, total	M200.8 ICP-MS	0.0967			mg/L	0.0005	0.003	09/19/07 7:21	jjr
Iron, dissolved	M200.7 ICP	0.16			mg/L	0.02	0.05	09/27/07 2:49	djt
Iron, total	M200.7 ICP	2.59			mg/L	0.04	0.1	09/30/07 17:17	erf
Lead, dissolved	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	09/22/07 13:58	scp
Lead, total	M200.8 ICP-MS	0.0022			mg/L	0.0001	0.0005	09/19/07 7:21	jjr
Magnesium, dissolved	M200.7 ICP	2.0			mg/L	0.2	1	09/26/07 3:12	djt
Manganese, dissolved	M200.8 ICP-MS	0.0170			mg/L	0.0005	0.003	09/22/07 13:58	scp
Manganese, total	M200.8 ICP-MS	0.30			mg/L	0.01	0.05	09/22/07 1:28	scp
Potassium, dissolved	M200.7 ICP	8.1			mg/L	0.3	2	09/26/07 3:12	djt
Sodium, dissolved	M200.7 ICP	2.3			mg/L	0.3	2	09/27/07 2:49	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
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Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW14

ACZ Sample ID: ***L65029-06***
Date Sampled: *09/12/07 15:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		22			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		22			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	11		*	mg/L	1	5	09/21/07 0:56	jag
Carbon, total organic (TOC)	415.1 / SM5310B	14		*	mg/L	2	10	09/24/07 21:05	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		33.3			%			10/05/07 0:00	calc
Sum of Anions		0.4	B		meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		0.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 15:00	jlf
Hardness as CaCO3	SM2340B - Calculation	26			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.03	B	*	mg/L	0.02	0.1	09/26/07 21:25	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.20			mg/L	0.01	0.05	10/03/07 12:49	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/28/07 8:22	jlf

** Please refer to Qualifier Reports for details.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65029***

Alkalinity as CaCO3 SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232801													
WG232801PBW1	PBW	09/21/07 12:28				U	mg/L		-20	20			
WG232801LCSW2	LCSW	09/21/07 12:40	WC070917-1	820		832	mg/L	101.5	90	110			
L65029-04DUP	DUP	09/21/07 14:22			42	41.9	mg/L				0.2	20	
L65031-05DUP	DUP	09/21/07 15:41			130	128.3	mg/L				1.3	20	
WG232801PBW2	PBW	09/21/07 15:47				U	mg/L		-20	20			
WG232801LCSW5	LCSW	09/21/07 16:00	WC070917-1	820		844.5	mg/L	103	90	110			
WG232801PBW3	PBW	09/21/07 18:47				U	mg/L		-20	20			
WG232801LCSW8	LCSW	09/21/07 18:59	WC070917-1	820		843.1	mg/L	102.8	90	110			
WG232801PBW4	PBW	09/21/07 21:57				U	mg/L		-20	20			
WG232801LCSW11	LCSW	09/21/07 22:10	WC070917-1	820		845.9	mg/L	103.2	90	110			
WG232801LCSW14	LCSW	09/22/07 0:06	WC070917-1	820		849.6	mg/L	103.6	90	110			

Aluminum, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232867													
WG232867ICV	ICV	09/22/07 12:04	MS070913-2	.1		.1031	mg/L	103.1	90	110			
WG232867ICB	ICB	09/22/07 12:10				U	mg/L		-0.003	0.003			
WG232867LFB1	LFB	09/22/07 12:16	MS070917-3	.05		.0557	mg/L	111.4	85	115			
L65024-01AS	AS	09/22/07 12:27	MS070917-3	.05	.006	.057	mg/L	102	70	130			
L65024-01ASD	ASD	09/22/07 12:33	MS070917-3	.05	.006	.055	mg/L	98	70	130	3.57	20	
L65029-05AS	AS	09/22/07 13:46	MS070917-3	.05	.075	.1289	mg/L	107.8	70	130			
L65029-05ASD	ASD	09/22/07 13:52	MS070917-3	.05	.075	.1309	mg/L	111.8	70	130	1.54	20	
WG232867LFB2	LFB	09/22/07 15:00	MS070917-3	.05		.0541	mg/L	108.2	85	115			

Aluminum, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232567													
WG232567ICV	ICV	09/19/07 5:59	MS070913-2	.1		.1036	mg/L	103.6	90	110			
WG232567ICB	ICB	09/19/07 6:04				U	mg/L		-0.003	0.003			
WG232502LRB	LRB	09/19/07 6:09				.0013	mg/L		-0.0022	0.0022			
WG232502LFB	LFB	09/19/07 6:14	MS070917-3	.05		.0507	mg/L	101.4	85	115			
L65029-02LFM	LFM	09/19/07 6:48	MS070917-3	.05	8.84	9.107	mg/L	534	70	130			M3
L65029-02LFMD	LFMD	09/19/07 7:02	MS070917-3	.05	8.84	9.449	mg/L	1218	70	130	3.69	20	M3
WG232742													
WG232742ICV	ICV	09/20/07 21:00	MS070913-2	.1		.0913	mg/L	91.3	90	110			
WG232742ICB	ICB	09/20/07 21:05				U	mg/L		-0.003	0.003			
WG232062LRB	LRB	09/20/07 21:10				.0013	mg/L		-0.0022	0.0022			
WG232062LFB	LFB	09/20/07 21:15	MS070828-5	.05		.0564	mg/L	112.8	85	115			
L64906-02LFM	LFM	09/20/07 21:25	MS070828-5	.05	.023	.0649	mg/L	83.8	70	130			
L64906-02LFMD	LFMD	09/20/07 21:30	MS070828-5	.05	.023	.064	mg/L	82	70	130	1.4	20	
WG232502LRB	LRB	09/20/07 21:45				.0015	mg/L		-0.0022	0.0022			
WG232502LFB	LFB	09/20/07 21:50	MS070917-3	.05		.0575	mg/L	115	85	115			
L65029-02LFM	LFM	09/20/07 22:10	MS070917-3	.05	10	10.848	mg/L	1696	70	130			M3
L65029-02LFMD	LFMD	09/20/07 22:15	MS070917-3	.05	10	10.55	mg/L	1100	70	130	2.79	20	M3

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65029***

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232867													
WG232867ICV	ICV	09/22/07 12:04	MS070913-2	.05		.05109	mg/L	102.2	90	110			
WG232867ICB	ICB	09/22/07 12:10				U	mg/L		-0.0003	0.0003			
WG232867LFB1	LFB	09/22/07 12:16	MS070917-3	.05		.05337	mg/L	106.7	85	115			
L65024-01AS	AS	09/22/07 12:27	MS070917-3	.05	U	.05142	mg/L	102.8	70	130			
L65024-01ASD	ASD	09/22/07 12:33	MS070917-3	.05	U	.05119	mg/L	102.4	70	130	0.45	20	
L65029-05AS	AS	09/22/07 13:46	MS070917-3	.05	U	.05229	mg/L	104.6	70	130			
L65029-05ASD	ASD	09/22/07 13:52	MS070917-3	.05	U	.05166	mg/L	103.3	70	130	1.21	20	
WG232867LFB2	LFB	09/22/07 15:00	MS070917-3	.05		.05239	mg/L	104.8	85	115			

Cadmium, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232567													
WG232567ICV	ICV	09/19/07 5:59	MS070913-2	.05		.04914	mg/L	98.3	90	110			
WG232567ICB	ICB	09/19/07 6:04				U	mg/L		-0.0003	0.0003			
WG232502LRB	LRB	09/19/07 6:09				U	mg/L		-0.00022	0.00022			
WG232502LFB	LFB	09/19/07 6:14	MS070917-3	.05		.04864	mg/L	97.3	85	115			
L65029-02LFM	LFM	09/19/07 6:48	MS070917-3	.05	.0002	.04783	mg/L	95.3	70	130			
L65029-02LFMD	LFMD	09/19/07 7:02	MS070917-3	.05	.0002	.04821	mg/L	96	70	130	0.79	20	

Calcium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232834													
WG232834ICV	ICV	09/22/07 0:55	II070911-1	100		101.55	mg/L	101.6	95	105			
WG232834ICB	ICB	09/22/07 0:59				U	mg/L		-0.6	0.6			
WG232834LFB	LFB	09/22/07 1:16	II070920-4	67.97008		74.28	mg/L	109.3	85	115			
L65025-03AS	AS	09/22/07 2:22	II070920-4	67.97008	65.3	138.48	mg/L	107.7	85	115			
L65025-03ASD	ASD	09/22/07 2:26	II070920-4	67.97008	65.3	138.01	mg/L	107	85	115	0.34	20	
WG232836													
WG232836ICV	ICV	09/26/07 1:56	II070911-1	100		97.79	mg/L	97.8	95	105			
WG232836ICB	ICB	09/26/07 2:00				U	mg/L		-0.6	0.6			
WG232836LFB	LFB	09/26/07 2:17	II070920-4	67.97008		71.97	mg/L	105.9	85	115			
L64873-01AS	AS	09/26/07 2:25	II070920-4	67.97008	108	169.65	mg/L	90.7	85	115			
L64873-01ASD	ASD	09/26/07 2:30	II070920-4	67.97008	108	167.91	mg/L	88.1	85	115	1.03	20	

Carbon, dissolved organic (DOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232755													
WG232755ICV	ICV	09/20/07 16:52	WI070822-1	75		69.6	mg/L	92.8	90	110			
WG232755ICB	ICB	09/20/07 17:06				U	mg/L		-3	3			
L65006-01AS	AS	09/20/07 21:22	WI070918-1	50	12	58.8	mg/L	93.6	90	110			
L65006-02DUP	DUP	09/20/07 21:51			8	9	mg/L				11.8	20	RA
WG232755LFB2	LFB	09/20/07 23:59	WI070918-1	50		46.6	mg/L	93.2	90	110			
L65029-01AS	AS	09/21/07 0:41	WI070918-1	50	3	46.3	mg/L	86.6	90	110			M2
L65029-06DUP	DUP	09/21/07 1:10			11	10.6	mg/L				3.7	20	
WG232755LFB1	LFB	09/21/07 12:20	WI070918-1	50		46.4	mg/L	92.8	90	110			

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Project ID: OG01XB

ACZ Project ID: ***L65029***

Carbon, total organic (TOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232943													
WG232943ICV	ICV	09/24/07 17:04	WI070822-1	75		77.5	mg/L	103.3	90	110			
WG232943ICB	ICB	09/24/07 17:18				U	mg/L		-3	3			
WG232943LFB1	LFB	09/24/07 17:32	WI070918-1	50		47.2	mg/L	94.4	90	110			
L65029-01AS	AS	09/24/07 19:12	WI070918-1	50	3	52.1	mg/L	98.2	90	110			
L65029-02DUP	DUP	09/24/07 19:40			11	10.8	mg/L				1.8	20	RA
L65042-01AS	AS	09/24/07 21:34	WI070918-1	50	6	59.2	mg/L	106.4	90	110			
L65042-02DUP	DUP	09/24/07 22:02			6	5.5	mg/L				8.7	20	RA

Chloride 325.2 / SM4500Cl-E

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232948													
WG232948ICB	ICB	09/24/07 14:29				U	mg/L		-3	3			
WG232948ICV	ICV	09/24/07 14:29	WI070314-1	55		57	mg/L	103.6	90	110			
WG232948LFB1	LFB	09/24/07 14:48	WI070712-1	30		31.3	mg/L	104.3	90	110			
L65024-01AS	AS	09/24/07 14:48	WI070712-1	30	1	32	mg/L	103.3	90	110			
L65024-02DUP	DUP	09/24/07 14:48			U	1.2	mg/L				200	20	RA
L65029-06AS	AS	09/24/07 15:00	WI070712-1	30	2	33.4	mg/L	104.7	90	110			
L65036-01DUP	DUP	09/24/07 15:00			U	U	mg/L				0	20	RA
WG232948LFB2	LFB	09/24/07 15:27	WI070712-1	30		32.6	mg/L	108.7	90	110			

Copper, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232867													
WG232867ICV	ICV	09/22/07 12:04	MS070913-2	.05		.0485	mg/L	97	90	110			
WG232867ICB	ICB	09/22/07 12:10				U	mg/L		-0.0015	0.0015			
WG232867LFB1	LFB	09/22/07 12:16	MS070917-3	.05		.05018	mg/L	100.4	85	115			
L65024-01AS	AS	09/22/07 12:27	MS070917-3	.05	U	.04902	mg/L	98	70	130			
L65024-01ASD	ASD	09/22/07 12:33	MS070917-3	.05	U	.04878	mg/L	97.6	70	130	0.49	20	
L65029-05AS	AS	09/22/07 13:46	MS070917-3	.05	.0456	.09547	mg/L	99.7	70	130			
L65029-05ASD	ASD	09/22/07 13:52	MS070917-3	.05	.0456	.09428	mg/L	97.4	70	130	1.25	20	
WG232867LFB2	LFB	09/22/07 15:00	MS070917-3	.05		.04959	mg/L	99.2	85	115			

Copper, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232567													
WG232567ICV	ICV	09/19/07 5:59	MS070913-2	.05		.04535	mg/L	90.7	90	110			
WG232567ICB	ICB	09/19/07 6:04				U	mg/L		-0.0015	0.0015			
WG232502LRB	LRB	09/19/07 6:09				U	mg/L		-0.0011	0.0011			
WG232502LFB	LFB	09/19/07 6:14	MS070917-3	.05		.04481	mg/L	89.6	85	115			
L65029-02LFM	LFM	09/19/07 6:48	MS070917-3	.05	.188	.2321	mg/L	88.2	70	130			
L65029-02LFMD	LFMD	09/19/07 7:02	MS070917-3	.05	.188	.2362	mg/L	96.4	70	130	1.75	20	

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ACZ Project ID: ***L65029***

Iron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232834													
WG232834ICV	ICV	09/22/07 0:55	II070911-1	2		2.066	mg/L	103.3	95	105			
WG232834ICB	ICB	09/22/07 0:59				U	mg/L		-0.06	0.06			
WG232834LFB	LFB	09/22/07 1:16	II070920-4	1		1.072	mg/L	107.2	85	115			
L65025-03AS	AS	09/22/07 2:22	II070920-4	1	.08	1.133	mg/L	105.3	85	115			
L65025-03ASD	ASD	09/22/07 2:26	II070920-4	1	.08	1.153	mg/L	107.3	85	115	1.75	20	
WG233112													
WG233112ICV	ICV	09/27/07 1:41	II070911-1	2		1.906	mg/L	95.3	95	105			
WG233112ICB	ICB	09/27/07 1:45				U	mg/L		-0.06	0.06			
WG233112LFB	LFB	09/27/07 2:00	II070920-4	1		1.001	mg/L	100.1	85	115			
L64873-01AS	AS	09/27/07 2:07	II070920-4	1	.03	1.023	mg/L	99.3	85	115			
L64873-01ASD	ASD	09/27/07 2:11	II070920-4	1	.03	1.011	mg/L	98.1	85	115	1.18	20	

Iron, total M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233352													
WG233352ICV	ICV	09/30/07 16:06	II070922-1	2		1.972	mg/L	98.6	95	105			
WG233352ICB	ICB	09/30/07 16:10				U	mg/L		-0.06	0.06			
WG233330LRB	LRB	09/30/07 16:27				.024	mg/L		-0.044	0.044			
WG233330LFB	LFB	09/30/07 16:31	II070926-8	1		1.017	mg/L	101.7	85	115			
L65029-01LFM	LFM	09/30/07 16:43	II070926-8	1	.04	1.058	mg/L	101.8	70	130			
L65029-01LFMD	LFMD	09/30/07 16:47	II070926-8	1	.04	1.052	mg/L	101.2	70	130	0.57	20	

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232867													
WG232867ICV	ICV	09/22/07 12:04	MS070913-2	.05		.04948	mg/L	99	90	110			
WG232867ICB	ICB	09/22/07 12:10				U	mg/L		-0.0003	0.0003			
WG232867LFB1	LFB	09/22/07 12:16	MS070917-3	.05		.05252	mg/L	105	85	115			
L65024-01AS	AS	09/22/07 12:27	MS070917-3	.05	.0002	.05187	mg/L	103.3	70	130			
L65024-01ASD	ASD	09/22/07 12:33	MS070917-3	.05	.0002	.05181	mg/L	103.2	70	130	0.12	20	
L65029-05AS	AS	09/22/07 13:46	MS070917-3	.05	U	.05053	mg/L	101.1	70	130			
L65029-05ASD	ASD	09/22/07 13:52	MS070917-3	.05	U	.05072	mg/L	101.4	70	130	0.38	20	
WG232867LFB2	LFB	09/22/07 15:00	MS070917-3	.05		.04975	mg/L	99.5	85	115			

Lead, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232567													
WG232567ICV	ICV	09/19/07 5:59	MS070913-2	.05		.0452	mg/L	90.4	90	110			
WG232567ICB	ICB	09/19/07 6:04				U	mg/L		-0.0003	0.0003			
WG232502LRB	LRB	09/19/07 6:09				U	mg/L		-0.00022	0.00022			
WG232502LFB	LFB	09/19/07 6:14	MS070917-3	.05		.04461	mg/L	89.2	85	115			
L65029-02LFM	LFM	09/19/07 6:48	MS070917-3	.05	.0061	.05417	mg/L	96.1	70	130			
L65029-02LFMD	LFMD	09/19/07 7:02	MS070917-3	.05	.0061	.05318	mg/L	94.2	70	130	1.84	20	

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ACZ Project ID: ***L65029***

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232834													
WG232834ICV	ICV	09/22/07 0:55	II070911-1	100		103.12	mg/L	103.1	95	105			
WG232834ICB	ICB	09/22/07 0:59				U	mg/L		-0.6	0.6			
WG232834LFB	LFB	09/22/07 1:16	II070920-4	54.96908		59.93	mg/L	109	85	115			
L65025-03AS	AS	09/22/07 2:22	II070920-4	54.96908	26.2	86.13	mg/L	109	85	115			
L65025-03ASD	ASD	09/22/07 2:26	II070920-4	54.96908	26.2	86.61	mg/L	109.9	85	115	0.56	20	
WG232836													
WG232836ICV	ICV	09/26/07 1:56	II070911-1	100		98.73	mg/L	98.7	95	105			
WG232836ICB	ICB	09/26/07 2:00				U	mg/L		-0.6	0.6			
WG232836LFB	LFB	09/26/07 2:17	II070920-4	54.96908		57.76	mg/L	105.1	85	115			
L64873-01AS	AS	09/26/07 2:25	II070920-4	54.96908	110	158.1	mg/L	87.5	85	115			
L64873-01ASD	ASD	09/26/07 2:30	II070920-4	54.96908	110	156.76	mg/L	85.1	85	115	0.85	20	

Manganese, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232867													
WG232867ICV	ICV	09/22/07 12:04	MS070913-2	.05		.05069	mg/L	101.4	90	110			
WG232867ICB	ICB	09/22/07 12:10				U	mg/L		-0.0015	0.0015			
WG232867LFB1	LFB	09/22/07 12:16	MS070917-3	.05		.05395	mg/L	107.9	85	115			
L65024-01AS	AS	09/22/07 12:27	MS070917-3	.05	.325	.37	mg/L	90	70	130			
L65024-01ASD	ASD	09/22/07 12:33	MS070917-3	.05	.325	.37	mg/L	90	70	130	0	20	
L65029-05AS	AS	09/22/07 13:46	MS070917-3	.05	.0115	.06384	mg/L	104.7	70	130			
L65029-05ASD	ASD	09/22/07 13:52	MS070917-3	.05	.0115	.0645	mg/L	106	70	130	1.03	20	
WG232867LFB2	LFB	09/22/07 15:00	MS070917-3	.05		.05356	mg/L	107.1	85	115			

Manganese, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232567													
WG232567ICV	ICV	09/19/07 5:59	MS070913-2	.05		.05121	mg/L	102.4	90	110			
WG232567ICB	ICB	09/19/07 6:04				U	mg/L		-0.0015	0.0015			
WG232502LRB	LRB	09/19/07 6:09				U	mg/L		-0.0011	0.0011			
WG232502LFB	LFB	09/19/07 6:14	MS070917-3	.05		.05028	mg/L	100.6	85	115			
L65029-02LFM	LFM	09/19/07 6:48	MS070917-3	.05	.115	.1595	mg/L	89	70	130			
L65029-02LFMD	LFMD	09/19/07 7:02	MS070917-3	.05	.115	.1623	mg/L	94.6	70	130	1.74	20	
WG232835													
WG232835ICV	ICV	09/22/07 0:49	MS070913-2	.05		.05436	mg/L	108.7	90	110			
WG232835ICB	ICB	09/22/07 0:54				U	mg/L		-0.0015	0.0015			
WG232502LRB	LRB	09/22/07 0:59				U	mg/L		-0.0011	0.0011			
WG232502LFB	LFB	09/22/07 1:04	MS070917-3	.05		.05248	mg/L	105	85	115			
L65029-02LFM	LFM	09/22/07 1:13	MS070917-3	.05	.12	.172	mg/L	104	70	130			
L65029-02LFMD	LFMD	09/22/07 1:18	MS070917-3	.05	.12	.173	mg/L	106	70	130	0.58	20	
WG232691LFB	LFB	09/22/07 1:58	MS070828-5	.05		.05138	mg/L	102.8	85	115			

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Project ID: OG01XB

ACZ Project ID: ***L65029***

Nitrate/Nitrite as N M353.2 - H2SO4 preserved

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233068													
WG233068ICV	ICV	09/26/07 20:59	WI070911-1	2.416		2.374	mg/L	98.3	90	110			
WG233068ICB	ICB	09/26/07 21:01				.024	mg/L		-0.06	0.06			
WG233068LFB1	LFB	09/26/07 21:02	WI070911-4	2		1.999	mg/L	100	90	110			
L65027-01DUP	DUP	09/26/07 21:07			.49	.526	mg/L				7.1	20	
L65029-05AS	AS	09/26/07 21:23	WI070911-4	2	1.95	3.941	mg/L	99.6	90	110			
L65029-06DUP	DUP	09/26/07 21:26			.03	.038	mg/L				23.5	20	RA
WG233068LFB2	LFB	09/26/07 21:44	WI070911-4	2		1.984	mg/L	99.2	90	110			
L64874-03AS	AS	09/26/07 22:17	WI070911-4	20	11.5	30.29	mg/L	94	90	110			

Phosphorus, total M365.1 - Auto Ascorbic Acid (digest)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233005													
WG232887ICV	ICV	09/25/07 12:37	WI070329-1	.65228		.696	mg/L	106.7	90	110			
WG232887ICB	ICB	09/25/07 12:39				U	mg/L		-0.03	0.03			
WG233062													
WG233020ICV	ICV	09/25/07 18:00	WI070329-1	.65228		.72	mg/L	110.4	90	110			
WG233020ICB	ICB	09/25/07 18:02				U	mg/L		-0.03	0.03			
WG233020LRB	LRB	09/25/07 18:03				U	mg/L		-0.03	0.03			
WG233020LFB	LFB	09/25/07 18:04	WI070919-4	.5		.482	mg/L	96.4	90	110			
L65025-02DUP	DUP	09/25/07 18:25			.01	.016	mg/L				46.2	20	RA
L65025-01LFM	LFM	09/25/07 18:44	WI070919-4	.5	.01	.466	mg/L	91.2	90	110			
WG233579													
WG233361ICV	ICV	10/03/07 12:37	WI070329-1	.65228		.678	mg/L	103.9	90	110			
WG233361ICB	ICB	10/03/07 12:39				U	mg/L		-0.03	0.03			
WG233361LRB	LRB	10/03/07 12:40				U	mg/L		-0.03	0.03			
WG233361LFB	LFB	10/03/07 12:41	WI070919-3	.5		.512	mg/L	102.4	90	110			
L65029-03DUP	DUP	10/03/07 12:45			.42	.441	mg/L				4.9	20	
L65029-02LFM	LFM	10/03/07 13:14	WI070919-3	.5	.42	.906	mg/L	97.2	90	110			

Potassium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232880													
WG232880ICV	ICV	09/23/07 18:49	II070911-1	20		19.92	mg/L	99.6	95	105			
WG232880ICB	ICB	09/23/07 18:52				U	mg/L		-0.9	0.9			
WG232880LFB	LFB	09/23/07 19:08	II070920-4	99.76186		112.37	mg/L	112.6	85	115			
L65025-03AS	AS	09/23/07 20:10	II070920-4	99.76186	2.3	121.22	mg/L	119.2	85	115			M1
L65025-03ASD	ASD	09/23/07 20:13	II070920-4	99.76186	2.3	120.35	mg/L	118.3	85	115	0.72	20	M1
WG232836													
WG232836ICV	ICV	09/26/07 1:56	II070911-1	20		19.98	mg/L	99.9	95	105			
WG232836ICB	ICB	09/26/07 2:00				U	mg/L		-0.9	0.9			
WG232836LFB	LFB	09/26/07 2:17	II070920-4	99.76186		106.81	mg/L	107.1	85	115			
L64873-01AS	AS	09/26/07 2:25	II070920-4	99.76186	1.9	114.06	mg/L	112.4	85	115			
L64873-01ASD	ASD	09/26/07 2:30	II070920-4	99.76186	1.9	113.78	mg/L	112.1	85	115	0.25	20	

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Project ID: OG01XB

ACZ Project ID: ***L65029***

Sodium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232834													
WG232834ICV	ICV	09/22/07 0:55	II070911-1	100		99.08	mg/L	99.1	95	105			
WG232834ICB	ICB	09/22/07 0:59				U	mg/L		-0.9	0.9			
WG232834LFB	LFB	09/22/07 1:16	II070920-4	98.21624		102.11	mg/L	104	85	115			
L65025-03AS	AS	09/22/07 2:22	II070920-4	98.21624	2.5	104.37	mg/L	103.7	85	115			
L65025-03ASD	ASD	09/22/07 2:26	II070920-4	98.21624	2.5	105.2	mg/L	104.6	85	115	0.79	20	
WG233112													
WG233112ICV	ICV	09/27/07 1:41	II070911-1	100		100.37	mg/L	100.4	95	105			
WG233112ICB	ICB	09/27/07 1:45				U	mg/L		-0.9	0.9			
WG233112LFB	LFB	09/27/07 2:00	II070920-4	98.21624		98.91	mg/L	100.7	85	115			
L64873-01AS	AS	09/27/07 2:07	II070920-4	98.21624	175	274.22	mg/L	101	85	115			
L64873-01ASD	ASD	09/27/07 2:11	II070920-4	98.21624	175	269.37	mg/L	96.1	85	115	1.78	20	

Sulfate 375.4 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233166													
WG233166ICB	ICB	09/27/07 7:53				U	mg/L		-3	3			
WG233166ICV	ICV	09/27/07 7:53	WI070919-2	20.04		20.3	mg/L	101.3	90	110			
WG233166LFB2	LFB	09/27/07 8:39	WI070718-3	10		10	mg/L	100	90	110			
WG233166LFB3	LFB	09/27/07 9:02	WI070718-3	10		9	mg/L	90	90	110			
WG233166ICB1	ICB	09/28/07 7:57				U	mg/L		-3	3			
WG233166ICV1	ICV	09/28/07 7:57	WI070919-2	20.04		20.6	mg/L	102.8	90	110			
WG233166LFB1	LFB	09/28/07 8:14	WI070718-3	10		9.7	mg/L	97	90	110			
L65025-02AS	AS	09/28/07 8:22	WI070718-3	10	2	10.7	mg/L	87	90	110			M2
L65025-03DUP	DUP	09/28/07 9:31			26	25.2	mg/L				3.1	20	

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

SRK Consulting ACZ Project ID: ***L65029***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65029-01	WG232567	Aluminum, total	M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232880	Potassium, dissolved	M200.7 ICP	M1	Matrix spike recovery was high, the method control sample recovery was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233062	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
L65029-02	WG233330	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.
	WG232742	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232880	Potassium, dissolved	M200.7 ICP	M1	Matrix spike recovery was high, the method control sample recovery was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	DF	Sample required dilution due to high sediment.
			415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
L65029-03	WG233330	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.
	WG232742	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232880	Potassium, dissolved	M200.7 ICP	M1	Matrix spike recovery was high, the method control sample recovery was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	DF	Sample required dilution due to high sediment.
			415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.

SRK Consulting ACZ Project ID: ***L65029***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65029-04	WG233330	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.
	WG232742	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232880	Potassium, dissolved	M200.7 ICP	M1	Matrix spike recovery was high, the method control sample recovery was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	DF	Sample required dilution due to high sediment.
			415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
L65029-05	WG233330	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.
	WG232742	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	DF	Sample required dilution due to high sediment.
			415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233068	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

SRK Consulting ACZ Project ID: ***L65029***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65029-06	WG233330	Total Hot Plate Digestion	M200.2 ICP	DF	Sample required dilution due to high sediment.
	WG232742	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	DF	Sample required dilution due to high sediment.
			415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233068	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.

SRK Consulting ACZ Project ID: ***L65029***

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Sulfate	375.4 - Turbidimetric

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID:	L65029
Date Received:	9/14/2007
Received By:	
Date Printed:	9/14/2007

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
1564	6.6	16

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L65029
Date Received: 9/14/2007
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L65029-01	CDW-1	Y	Y			Y	Y					
L65029-02	SW12	Y	Y			Y	Y					
L65029-03	SW312	Y	Y			Y	Y					
L65029-04	SW11	Y	Y			Y	Y					
L65029-05	SW13	Y	Y			Y	Y					
L65029-06	SW14	Y	Y			Y	Y					

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH-Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

L65029

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: LARRY COPE
Company: SRK CONSULTING
E-mail: lcope@srk.com
Address: 19 OLD TOWN SQ STE 238
FORT COLLINS, CO 80524
Telephone: 970-407-8302 EXT 12

Copy of Report to:

Name: N/A
Company:
E-mail:
Telephone:

Invoice to:

Name: PAM PINSON
Company: PHELPS DODGE MINING CO
E-mail: PAM.PINSON@FMI.COM
Address: CHINO MINES CO, BOX 13308
PHOENIX, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [X] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: 0 G01 X B
Reporting state for compliance testing: NM
Sampler's Name: MIKE SIEBER
Are any samples NRC licensable material? NO

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	WET CHEMISTRY	WET CHEMISTRY DISSOLVED	TOTAL METALS (NH4NO3)	DISSOLVED METALS (HNO3/FILT)	DOC WET CHEM FILTER	COD-TOC (H2SO4)		
CDW-1	9-12-07 / 8:45	SW	6	X	X	X	X	X	X		
SW12	9-12-07 / 10:20	SW	6	X	X	X	X	X	X		
SW312	9-12-07 / 10:45	SW	6	X	X	X	X	X	X		
SW11	9-12-07 / 11:15	SW	6	X	X	X	X	X	X		
SW13	9-12-07 / 12:15	SW	6	X	X	X	X	X	X		
SW14	9-12-07 15:20	SW	6	X	X	X	X	X	X		

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Jessica Brewer	9/13/07 11:45	[illegible]	9-14-07 10:44

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

October 05, 2007

Report to:
Larry Cope
SRK Consulting
19 Old Twon Square Suite 238
Fort Coliins, CO 80524

Bill to:
Accounts Payable Dept
Phelps Dodge Mining Company
Chino Mines Company PO Box 13308
Phoenix, AZ 85002-3308

Project ID: OG01XB
ACZ Project ID: L65087

Larry Cope:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on September 18, 2007. This project has been assigned to ACZ's project number, L65087. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L65087. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after November 05, 2007. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl 05/Oct/07

Scott Habermehl, Project Manager, has reviewed and approved this report in its entirety.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW08

ACZ Sample ID: ***L65087-01***
Date Sampled: *09/14/07 10:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:44	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 13:55	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 18:48	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.009			mg/L	0.001	0.005	09/25/07 10:31	jjr
Aluminum, total	M200.8 ICP-MS	0.027		*	mg/L	0.001	0.005	09/28/07 18:08	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:31	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 12:36	scp
Calcium, dissolved	M200.7 ICP	24.5			mg/L	0.2	1	09/26/07 9:06	djt
Copper, dissolved	M200.8 ICP-MS	0.0047			mg/L	0.0005	0.003	09/25/07 10:31	jjr
Copper, total	M200.8 ICP-MS	0.0052			mg/L	0.0005	0.003	09/24/07 20:11	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/26/07 9:06	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/28/07 0:04	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:31	jjr
Lead, total	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	09/21/07 12:36	scp
Magnesium, dissolved	M200.7 ICP	11.6			mg/L	0.2	1	09/26/07 9:06	djt
Manganese, dissolved	M200.8 ICP-MS	0.0007	B		mg/L	0.0005	0.003	09/25/07 10:31	jjr
Manganese, total	M200.8 ICP-MS	0.0006	B		mg/L	0.0005	0.003	09/21/07 12:36	scp
Potassium, dissolved	M200.7 ICP	2.6			mg/L	0.3	2	09/26/07 9:06	djt
Sodium, dissolved	M200.7 ICP	16.2			mg/L	0.3	2	09/26/07 9:06	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW08

ACZ Sample ID: ***L65087-01***
Date Sampled: *09/14/07 10:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		120			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		120		*	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	5	B	*	mg/L	1	5	09/21/07 1:53	jag
Carbon, total organic (TOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/25/07 0:10	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		9.4			%			10/05/07 0:00	calc
Sum of Anions		2.4			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.9			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	109			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:07	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.06		*	mg/L	0.01	0.05	10/03/07 14:22	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/27/07 8:51	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW07

ACZ Sample ID: ***L65087-02***
Date Sampled: *09/14/07 11:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:46	aml
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:00	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:04	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.019			mg/L	0.001	0.005	09/25/07 10:37	jjr
Aluminum, total	M200.8 ICP-MS	0.049		*	mg/L	0.001	0.005	09/28/07 18:13	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:37	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 12:41	scp
Calcium, dissolved	M200.7 ICP	21.9			mg/L	0.2	1	09/26/07 9:19	djt
Copper, dissolved	M200.8 ICP-MS	0.0081			mg/L	0.0005	0.003	09/25/07 10:37	jjr
Copper, total	M200.8 ICP-MS	0.0096			mg/L	0.0005	0.003	09/24/07 20:17	msh
Iron, dissolved	M200.7 ICP	0.03	B		mg/L	0.02	0.05	09/26/07 9:19	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/28/07 0:08	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:37	jjr
Lead, total	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	09/21/07 12:41	scp
Magnesium, dissolved	M200.7 ICP	10.3			mg/L	0.2	1	09/26/07 9:19	djt
Manganese, dissolved	M200.8 ICP-MS	0.0042			mg/L	0.0005	0.003	09/25/07 10:37	jjr
Manganese, total	M200.8 ICP-MS	0.0042			mg/L	0.0005	0.003	09/21/07 12:41	scp
Potassium, dissolved	M200.7 ICP	3.1			mg/L	0.3	2	09/26/07 9:19	djt
Sodium, dissolved	M200.7 ICP	13.0			mg/L	0.3	2	09/26/07 9:19	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW07

ACZ Sample ID: ***L65087-02***
Date Sampled: *09/14/07 11:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		101			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		101		*	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	4	B	*	mg/L	1	5	09/21/07 2:07	jag
Carbon, total organic (TOC)	415.1 / SM5310B	5		*	mg/L	1	5	09/25/07 0:39	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		10.6			%			10/05/07 0:00	calc
Sum of Anions		2.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.6			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	97			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:08	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	0.09		*	mg/L	0.01	0.05	10/03/07 14:24	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/27/07 8:51	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: TB-1

ACZ Sample ID: ***L65087-03***
Date Sampled: *09/15/07 07:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:48	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:14	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:12	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.006			mg/L	0.001	0.005	09/25/07 10:43	jjr
Aluminum, total	M200.8 ICP-MS	0.001	B		mg/L	0.001	0.005	10/02/07 10:09	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:43	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 12:56	scp
Calcium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 9:32	djt
Copper, dissolved	M200.8 ICP-MS	0.0007	B		mg/L	0.0005	0.003	09/25/07 10:43	jjr
Copper, total	M200.8 ICP-MS	0.0012	B		mg/L	0.0005	0.003	09/24/07 20:33	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/26/07 9:32	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/28/07 0:12	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:43	jjr
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/24/07 20:33	msh
Magnesium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 9:32	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 10:43	jjr
Manganese, total	M200.8 ICP-MS	0.0006	B		mg/L	0.0005	0.003	09/21/07 12:56	scp
Potassium, dissolved	M200.7 ICP		U		mg/L	0.3	2	09/26/07 9:32	djt
Sodium, dissolved	M200.7 ICP		U		mg/L	0.3	2	09/26/07 9:32	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: TB-1

ACZ Sample ID: ***L65087-03***
Date Sampled: *09/15/07 07:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity			U	*	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/21/07 2:21	jag
Carbon, total organic (TOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/25/07 1:07	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		n/a			%			10/05/07 0:00	calc
Sum of Anions		N/A			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations			U		meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E		U	*	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:09	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	10/03/07 14:25	aml
Sulfate	375.4 - Turbidimetric		U	*	mg/L	1	5	09/27/07 9:01	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW09

ACZ Sample ID: ***L65087-04***
Date Sampled: *09/15/07 09:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:49	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:43	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:24	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.022			mg/L	0.001	0.005	09/25/07 10:49	jjr
Aluminum, total	M200.8 ICP-MS	0.027		*	mg/L	0.001	0.005	09/28/07 18:33	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:49	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 13:01	scp
Calcium, dissolved	M200.7 ICP	27.3			mg/L	0.2	1	09/26/07 9:36	djt
Copper, dissolved	M200.8 ICP-MS	0.0110			mg/L	0.0005	0.003	09/25/07 10:49	jjr
Copper, total	M200.8 ICP-MS	0.0132			mg/L	0.0005	0.003	09/24/07 20:39	msh
Iron, dissolved	M200.7 ICP	0.08			mg/L	0.02	0.05	09/26/07 9:36	djt
Iron, total	M200.7 ICP	0.11			mg/L	0.02	0.05	09/28/07 0:16	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:49	jjr
Lead, total	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	09/21/07 13:01	scp
Magnesium, dissolved	M200.7 ICP	12.3			mg/L	0.2	1	09/26/07 9:36	djt
Manganese, dissolved	M200.8 ICP-MS	0.0328			mg/L	0.0005	0.003	09/25/07 10:49	jjr
Manganese, total	M200.8 ICP-MS	0.0278			mg/L	0.0005	0.003	09/21/07 13:01	scp
Potassium, dissolved	M200.7 ICP	3.2			mg/L	0.3	2	09/26/07 9:36	djt
Sodium, dissolved	M200.7 ICP	8.1			mg/L	0.3	2	09/26/07 9:36	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW09

ACZ Sample ID: ***L65087-04***
Date Sampled: *09/15/07 09:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		8	B		mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		8	B	*	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	5		*	mg/L	1	5	09/21/07 2:35	jag
Carbon, total organic (TOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/25/07 2:04	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		5.7			%			10/05/07 0:00	calc
Sum of Anions		2.5			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	119			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:11	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	10/03/07 14:26	aml
Sulfate	375.4 - Turbidimetric	112		*	mg/L	5	30	09/27/07 9:08	jlf

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW10

ACZ Sample ID: ***L65087-05***
Date Sampled: *09/15/07 11:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:55	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:52	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:36	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.007			mg/L	0.001	0.005	09/25/07 10:54	jjr
Aluminum, total	M200.8 ICP-MS	0.013			mg/L	0.001	0.005	10/02/07 10:26	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:54	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 13:16	scp
Calcium, dissolved	M200.7 ICP	17.6			mg/L	0.2	1	09/26/07 9:40	djt
Copper, dissolved	M200.8 ICP-MS	0.0026	B		mg/L	0.0005	0.003	09/25/07 10:54	jjr
Copper, total	M200.8 ICP-MS	0.0030			mg/L	0.0005	0.003	09/24/07 20:45	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/26/07 9:40	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/28/07 0:21	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:54	jjr
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/24/07 20:45	msh
Magnesium, dissolved	M200.7 ICP	7.4			mg/L	0.2	1	09/26/07 9:40	djt
Manganese, dissolved	M200.8 ICP-MS	0.0077			mg/L	0.0005	0.003	09/25/07 10:54	jjr
Manganese, total	M200.8 ICP-MS	0.0066			mg/L	0.0005	0.003	09/21/07 13:16	scp
Potassium, dissolved	M200.7 ICP	2.8			mg/L	0.3	2	09/26/07 9:40	djt
Sodium, dissolved	M200.7 ICP	7.5			mg/L	0.3	2	09/26/07 9:40	djt

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW10

ACZ Sample ID: ***L65087-05***
Date Sampled: *09/15/07 11:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		23			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		23			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	3	B	*	mg/L	1	5	09/21/07 2:49	jag
Carbon, total organic (TOC)	415.1 / SM5310B	3	B	*	mg/L	1	5	09/25/07 2:18	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		9.1			%			10/05/07 0:00	calc
Sum of Anions		1.5			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	2	B	*	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	74			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:14	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	10/03/07 14:29	aml
Sulfate	375.4 - Turbidimetric	51		*	mg/L	5	30	09/27/07 9:08	jlf

** Please refer to Qualifier Reports for details.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65087***

Alkalinity as CaCO3 SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232898													
WG232898PBW1	PBW	09/24/07 10:22				U	mg/L		-20	20			
WG232898LCSW2	LCSW	09/24/07 10:34	WC070917-1	820		829.4	mg/L	101.1	90	110			
WG232898PBW2	PBW	09/24/07 13:24				U	mg/L		-20	20			
WG232898LCSW5	LCSW	09/24/07 13:36	WC070917-1	820		837.7	mg/L	102.2	90	110			
L65087-04DUP	DUP	09/24/07 14:56			8	7.9	mg/L				1.3	20	RA
L65103-02DUP	DUP	09/24/07 16:17			56	55.6	mg/L				0.7	20	
WG232898PBW3	PBW	09/24/07 16:23				U	mg/L		-20	20			
WG232898LCSW8	LCSW	09/24/07 16:35	WC070917-1	820		839.1	mg/L	102.3	90	110			
WG232898PBW4	PBW	09/24/07 19:48				U	mg/L		-20	20			
WG232898LCSW11	LCSW	09/24/07 20:01	WC070917-1	820		841.1	mg/L	102.6	90	110			
WG232898LCSW14	LCSW	09/25/07 0:09	WC070917-1	820		846.1	mg/L	103.2	90	110			

Aluminum, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.1		.1043	mg/L	104.3	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.003	0.003			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.0465	mg/L	93	85	115			
L65062-01AS	AS	09/25/07 9:40	MS070917-3	.5	.15	.601	mg/L	90.2	70	130			
L65062-01ASD	ASD	09/25/07 9:45	MS070917-3	.5	.15	.627	mg/L	95.4	70	130	4.23	20	
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	.007	.0515	mg/L	89	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	.007	.0507	mg/L	87.4	70	130	1.57	20	

Aluminum, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233277													
WG233277ICV	ICV	09/28/07 16:48	MS070913-2	.1		.1053	mg/L	105.3	90	110			
WG233277ICB	ICB	09/28/07 16:53				U	mg/L		-0.003	0.003			
WG233195LRB	LRB	09/28/07 16:58				.0025	mg/L		-0.0022	0.0022			B7
WG233195LFB	LFB	09/28/07 17:03	MS070917-3	.05		.0505	mg/L	101	85	115			
L64960-02LFM	LFM	09/28/07 17:18	MS2XW	.1	2.94	2.982	mg/L	42	70	130			M3
L64960-02LFMD	LFMD	09/28/07 17:23	MS2XW	.1	2.94	3.042	mg/L	102	70	130	1.99	20	
L65087-03LFM	LFM	09/28/07 18:23	MS070917-3	.05	.002	.0535	mg/L	103	70	130			
L65087-03LFMD	LFMD	09/28/07 18:28	MS070917-3	.05	.002	.0522	mg/L	100.4	70	130	2.46	20	
WG233448													
WG233448ICV	ICV	10/02/07 8:49	MS070913-2	.1		.1066	mg/L	106.6	90	110			
WG233448ICB	ICB	10/02/07 8:55				U	mg/L		-0.003	0.003			
WG233195LRB	LRB	10/02/07 9:00				U	mg/L		-0.0022	0.0022			
WG233195LFB	LFB	10/02/07 9:06	MS070917-3	.05		.0473	mg/L	94.6	85	115			
L65087-03LFM	LFM	10/02/07 10:14	MS070917-3	.05	.001	.0481	mg/L	94.2	70	130			
L65087-03LFMD	LFMD	10/02/07 10:20	MS070917-3	.05	.001	.0468	mg/L	91.6	70	130	2.74	20	

SRK Consulting
Project ID: OG01XB

ACZ Project ID: ***L65087***

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.05431	mg/L	108.6	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0003	0.0003			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.04889	mg/L	97.8	85	115			
L65062-01AS	AS	09/25/07 9:40	MS070917-3	.5	U	.4772	mg/L	95.4	70	130			
L65062-01ASD	ASD	09/25/07 9:45	MS070917-3	.5	U	.483	mg/L	96.6	70	130	1.21	20	
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	U	.04981	mg/L	99.6	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	U	.04955	mg/L	99.1	70	130	0.52	20	

Cadmium, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232744													
WG232744ICV	ICV	09/21/07 11:12	MS070913-2	.05		.05073	mg/L	101.5	90	110			
WG232744ICB	ICB	09/21/07 11:17				U	mg/L		-0.0003	0.0003			
WG232571LRB	LRB	09/21/07 11:23				U	mg/L		-0.00022	0.00022			
WG232571LFB	LFB	09/21/07 11:28	MS070917-3	.05		.0437	mg/L	87.4	85	115			
L65040-02LFM	LFM	09/21/07 11:47	MS070917-3	.05	U	.0454	mg/L	90.8	70	130			
L65040-02LFMD	LFMD	09/21/07 11:52	MS070917-3	.05	U	.04551	mg/L	91	70	130	0.24	20	
L65087-02LFM	LFM	09/21/07 12:46	MS070917-3	.05	U	.04627	mg/L	92.5	70	130			
L65087-02LFMD	LFMD	09/21/07 12:51	MS070917-3	.05	U	.04532	mg/L	90.6	70	130	2.07	20	

Calcium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	100		97.58	mg/L	97.6	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.6	0.6			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	67.97008		75.08	mg/L	110.5	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	67.97008	24.5	98.78	mg/L	109.3	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	67.97008	24.5	98.83	mg/L	109.4	85	115	0.05	20	

Carbon, dissolved organic (DOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232755													
WG232755ICV	ICV	09/20/07 16:52	WI070822-1	75		69.6	mg/L	92.8	90	110			
WG232755ICB	ICB	09/20/07 17:06				U	mg/L		-3	3			
WG232755LFB2	LFB	09/20/07 23:59	WI070918-1	50		46.6	mg/L	93.2	90	110			
L65029-01AS	AS	09/21/07 0:41	WI070918-1	50	3	46.3	mg/L	86.6	90	110			M2
L65029-06DUP	DUP	09/21/07 1:10			11	10.6	mg/L				3.7	20	
WG232755LFB1	LFB	09/21/07 12:20	WI070918-1	50		46.4	mg/L	92.8	90	110			

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ACZ Project ID: ***L65087***

Carbon, total organic (TOC) 415.1 / SM5310B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232943													
WG232943ICV	ICV	09/24/07 17:04	WI070822-1	75		77.5	mg/L	103.3	90	110			
WG232943ICB	ICB	09/24/07 17:18				U	mg/L		-3	3			
WG232943LFB1	LFB	09/24/07 17:32	WI070918-1	50		47.2	mg/L	94.4	90	110			
L65042-01AS	AS	09/24/07 21:34	WI070918-1	50	6	59.2	mg/L	106.4	90	110			
L65042-02DUP	DUP	09/24/07 22:02			6	5.5	mg/L				8.7	20	RA
L65087-02AS	AS	09/25/07 0:53	WI070918-1	50	5	58	mg/L	106	90	110			
L65087-03DUP	DUP	09/25/07 1:21			U	U	mg/L				0	20	RA

Chloride 325.2 / SM4500Cl-E

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232948													
WG232948ICB	ICB	09/24/07 14:29				U	mg/L		-3	3			
WG232948ICV	ICV	09/24/07 14:29	WI070314-1	55		57	mg/L	103.6	90	110			
WG232948LFB1	LFB	09/24/07 14:48	WI070712-1	30		31.3	mg/L	104.3	90	110			
WG232948LFB2	LFB	09/24/07 15:27	WI070712-1	30		32.6	mg/L	108.7	90	110			
L65036-10AS	AS	09/24/07 15:27	WI070712-1	30	U	30.8	mg/L	102.7	90	110			
L65036-11DUP	DUP	09/24/07 15:27			U	U	mg/L				0	20	RA

Copper, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.05485	mg/L	109.7	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0015	0.0015			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.05025	mg/L	100.5	85	115			
L65062-01AS	AS	09/25/07 9:40	MS070917-3	.5	.005	.4713	mg/L	93.3	70	130			
L65062-01ASD	ASD	09/25/07 9:45	MS070917-3	.5	.005	.4776	mg/L	94.5	70	130	1.33	20	
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	.0026	.05034	mg/L	95.5	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	.0026	.05029	mg/L	95.4	70	130	0.1	20	

Copper, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232961													
WG232961ICV	ICV	09/24/07 18:53	MS070913-2	.05		.0514	mg/L	102.8	90	110			
WG232961ICB	ICB	09/24/07 18:59				U	mg/L		-0.0015	0.0015			
WG232571LRB	LRB	09/24/07 19:04				U	mg/L		-0.0011	0.0011			
WG232571LFB	LFB	09/24/07 19:10	MS070917-3	.05		.05282	mg/L	105.6	85	115			
L65040-02LFM	LFM	09/24/07 19:26	MS070917-3	.05	.0021	.04845	mg/L	92.7	70	130			
L65040-02LFMD	LFMD	09/24/07 19:32	MS070917-3	.05	.0021	.04892	mg/L	93.6	70	130	0.97	20	
L65087-02LFM	LFM	09/24/07 20:22	MS070917-3	.05	.0096	.05905	mg/L	98.9	70	130			
L65087-02LFMD	LFMD	09/24/07 20:28	MS070917-3	.05	.0096	.0583	mg/L	97.4	70	130	1.28	20	

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ACZ Project ID: ***L65087***

Iron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	2		1.962	mg/L	98.1	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.06	0.06			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	1		1.078	mg/L	107.8	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	1	U	1.094	mg/L	109.4	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	1	U	1.088	mg/L	108.8	85	115	0.55	20	

Iron, total M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233185													
WG233185ICV	ICV	09/27/07 22:58	II070922-1	2		1.966	mg/L	98.3	95	105			
WG233185ICB	ICB	09/27/07 23:02				U	mg/L		-0.06	0.06			
WG232945LRB	LRB	09/27/07 23:19				U	mg/L		-0.044	0.044			
WG232945LFB	LFB	09/27/07 23:23	II070920-4	1		.974	mg/L	97.4	85	115			
L65068-01LFM	LFM	09/27/07 23:31	II070920-4	1	1.8	2.74	mg/L	94	70	130			
L65068-01LFMD	LFMD	09/27/07 23:35	II070920-4	1	1.8	2.785	mg/L	98.5	70	130	1.63	20	

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.0547	mg/L	109.4	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0003	0.0003			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.04909	mg/L	98.2	85	115			
L65062-01AS	AS	09/25/07 9:40	MS070917-3	.5	U	.4883	mg/L	97.7	70	130			
L65062-01ASD	ASD	09/25/07 9:45	MS070917-3	.5	U	.4942	mg/L	98.8	70	130	1.2	20	
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	U	.04831	mg/L	96.6	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	U	.04829	mg/L	96.6	70	130	0.04	20	

Lead, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232744													
WG232744ICV	ICV	09/21/07 11:12	MS070913-2	.05		.05011	mg/L	100.2	90	110			
WG232744ICB	ICB	09/21/07 11:17				U	mg/L		-0.0003	0.0003			
WG232571LRB	LRB	09/21/07 11:23				U	mg/L		-0.00022	0.00022			
WG232571LFB	LFB	09/21/07 11:28	MS070917-3	.05		.04323	mg/L	86.5	85	115			
L65040-02LFM	LFM	09/21/07 11:47	MS070917-3	.05	U	.04323	mg/L	86.5	70	130			
L65040-02LFMD	LFMD	09/21/07 11:52	MS070917-3	.05	U	.04424	mg/L	88.5	70	130	2.31	20	
L65087-02LFM	LFM	09/21/07 12:46	MS070917-3	.05	U	.05011	mg/L	100.2	70	130			
L65087-02LFMD	LFMD	09/21/07 12:51	MS070917-3	.05	U	.0487	mg/L	97.4	70	130	2.85	20	
WG232961													
WG232961ICV	ICV	09/24/07 18:53	MS070913-2	.05		.04995	mg/L	99.9	90	110			
WG232961ICB	ICB	09/24/07 18:59				U	mg/L		-0.0003	0.0003			
WG232571LRB	LRB	09/24/07 19:04				U	mg/L		-0.00022	0.00022			
WG232571LFB	LFB	09/24/07 19:10	MS070917-3	.05		.05123	mg/L	102.5	85	115			
L65040-02LFM	LFM	09/24/07 19:26	MS070917-3	.05	U	.05265	mg/L	105.3	70	130			
L65040-02LFMD	LFMD	09/24/07 19:32	MS070917-3	.05	U	.05314	mg/L	106.3	70	130	0.93	20	
L65087-02LFM	LFM	09/24/07 20:22	MS070917-3	.05	U	.05157	mg/L	103.1	70	130			
L65087-02LFMD	LFMD	09/24/07 20:28	MS070917-3	.05	U	.05084	mg/L	101.7	70	130	1.43	20	

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Project ID: OG01XB

ACZ Project ID: ***L65087***

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	100		98.62	mg/L	98.6	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.6	0.6			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	54.96908		59.99	mg/L	109.1	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	54.96908	11.6	72.11	mg/L	110.1	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	54.96908	11.6	71.8	mg/L	109.5	85	115	0.43	20	

Manganese, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232971													
WG232971ICV	ICV	09/25/07 9:11	MS070913-2	.05		.05434	mg/L	108.7	90	110			
WG232971ICB	ICB	09/25/07 9:17				U	mg/L		-0.0015	0.0015			
WG232971LFB	LFB	09/25/07 9:28	MS070917-3	.05		.05047	mg/L	100.9	85	115			
L65062-01AS	AS	09/25/07 9:40	MS070917-3	.5	.147	.6363	mg/L	97.9	70	130			
L65062-01ASD	ASD	09/25/07 9:45	MS070917-3	.5	.147	.6442	mg/L	99.4	70	130	1.23	20	
L65087-05AS	AS	09/25/07 11:00	MS070917-3	.05	.0077	.05635	mg/L	97.3	70	130			
L65087-05ASD	ASD	09/25/07 11:06	MS070917-3	.05	.0077	.05616	mg/L	96.9	70	130	0.34	20	

Manganese, total M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG232744													
WG232744ICV	ICV	09/21/07 11:12	MS070913-2	.05		.05139	mg/L	102.8	90	110			
WG232744ICB	ICB	09/21/07 11:17				U	mg/L		-0.0015	0.0015			
WG232571LRB	LRB	09/21/07 11:23				U	mg/L		-0.0011	0.0011			
WG232571LFB	LFB	09/21/07 11:28	MS070917-3	.05		.04425	mg/L	88.5	85	115			
L65040-02LFM	LFM	09/21/07 11:47	MS070917-3	.05	.0447	.09282	mg/L	96.2	70	130			
L65040-02LFMD	LFMD	09/21/07 11:52	MS070917-3	.05	.0447	.091	mg/L	92.6	70	130	1.98	20	
L65087-02LFM	LFM	09/21/07 12:46	MS070917-3	.05	.0042	.04695	mg/L	85.5	70	130			
L65087-02LFMD	LFMD	09/21/07 12:51	MS070917-3	.05	.0042	.04595	mg/L	83.5	70	130	2.15	20	

Nitrate/Nitrite as N M353.2 - H2SO4 preserved

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233335													
WG233335ICV	ICV	09/28/07 17:46	WI070911-1	2.416		2.432	mg/L	100.7	90	110			
WG233335ICB	ICB	09/28/07 17:47				U	mg/L		-0.06	0.06			
WG233338													
WG233338ICV	ICV	09/28/07 20:47	WI070911-1	2.416		2.529	mg/L	104.7	90	110			
WG233338ICB	ICB	09/28/07 20:48				U	mg/L		-0.06	0.06			
WG233338LFB1	LFB	09/28/07 20:49	WI070911-4	2		2.115	mg/L	105.8	90	110			
L64915-01AS	AS	09/28/07 20:52	WI070911-4	2	U	2.046	mg/L	102.3	90	110			
L64915-02DUP	DUP	09/28/07 20:54			U	U	mg/L				0	20	RA
L65087-03AS	AS	09/28/07 21:10	WI070911-4	2	U	2.075	mg/L	103.8	90	110			
L65087-04DUP	DUP	09/28/07 21:13			U	U	mg/L				0	20	RA
WG233338LFB2	LFB	09/28/07 21:27	WI070911-4	2		2.114	mg/L	105.7	90	110			

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Project ID: OG01XB

ACZ Project ID: ***L65087***

Phosphorus, total M365.1 - Auto Ascorbic Acid (digest)

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233579													
WG233361ICV	ICV	10/03/07 12:37	WI070329-1	.65228		.678	mg/L	103.9	90	110			
WG233361ICB	ICB	10/03/07 12:39				U	mg/L		-0.03	0.03			
WG233585													
WG233390ICV	ICV	10/03/07 14:13	WI070329-1	.65228		.672	mg/L	103	90	110			
WG233390ICB	ICB	10/03/07 14:15				U	mg/L		-0.03	0.03			
WG233390LRB	LRB	10/03/07 14:16				U	mg/L		-0.03	0.03			
WG233390LFB	LFB	10/03/07 14:17	WI070919-4	.5		.501	mg/L	100.2	90	110			
L64961-02LFM	LFM	10/03/07 14:19	WI070919-4	.5	U	.497	mg/L	99.4	90	110			
L65088-05DUP	DUP	10/03/07 14:37			U	U	mg/L				0	20	RA
L64961-03DUP	DUP	10/03/07 14:50			U	U	mg/L				0	20	RA

Potassium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	20		19.92	mg/L	99.6	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.9	0.9			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	99.76186		111.29	mg/L	111.6	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	99.76186	2.6	116.06	mg/L	113.7	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	99.76186	2.6	115.33	mg/L	113	85	115	0.63	20	

Sodium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233022													
WG233022ICV	ICV	09/26/07 7:42	II070911-1	100		99.25	mg/L	99.3	95	105			
WG233022ICB	ICB	09/26/07 7:46				U	mg/L		-0.9	0.9			
WG233022LFB	LFB	09/26/07 8:03	II070920-4	98.21624		108.34	mg/L	110.3	85	115			
L65087-01AS	AS	09/26/07 9:10	II070920-4	98.21624	16.2	125.2	mg/L	111	85	115			
L65087-01ASD	ASD	09/26/07 9:15	II070920-4	98.21624	16.2	124.55	mg/L	110.3	85	115	0.52	20	

Sulfate 375.4 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG233166													
WG233166ICB	ICB	09/27/07 7:53				U	mg/L		-3	3			
WG233166ICV	ICV	09/27/07 7:53	WI070919-2	20.04		20.3	mg/L	101.3	90	110			
WG233166LFB2	LFB	09/27/07 8:39	WI070718-3	10		10	mg/L	100	90	110			
L65036-04DUP	DUP	09/27/07 8:50			16	16.4	mg/L				2.5	20	
L65087-02AS	AS	09/27/07 8:51	WI070718-3	10	U	U	mg/L	0	90	110			M2
L65087-03DUP	DUP	09/27/07 9:01			U	U	mg/L				0	20	RA
WG233166LFB3	LFB	09/27/07 9:02	WI070718-3	10		9	mg/L	90	90	110			
WG233166ICB1	ICB	09/28/07 7:57				U	mg/L		-3	3			
WG233166ICV1	ICV	09/28/07 7:57	WI070919-2	20.04		20.6	mg/L	102.8	90	110			
WG233166LFB1	LFB	09/28/07 8:14	WI070718-3	10		9.7	mg/L	97	90	110			

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

SRK Consulting ACZ Project ID: ***L65087***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65087-01	WG233277	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232744	Lead, total	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M1	Matrix spike recovery was high, the method control sample recovery was acceptable.
	WG232898	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L65087-02	WG233277	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
			M200.8 ICP-MS	M3	The accuracy of the spike recovery does not apply because analyte concentration in the sample is disproportionate to the spike level. The recovery of the method control sample was acceptable.
	WG232744	Lead, total	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232898	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

SRK Consulting ACZ Project ID: ***L65087***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65087-03	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232898	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
L65087-04	WG233277	Aluminum, total	M200.8 ICP-MS	B7	Target analyte detected in prep / method blank at or above acceptance limit. Sample value is > 10X the concentration in the method blank.
	WG232744	Lead, total	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232898	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

SRK Consulting ACZ Project ID: ***L65087***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L65087-05	WG232755	Carbon, dissolved organic (DOC)	415.1 / SM5310B	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
	WG232943	Carbon, total organic (TOC)	415.1 / SM5310B	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG232948	Chloride	325.2 / SM4500Cl-E	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233338	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233585	Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).
	WG233166	Sulfate	375.4 - Turbidimetric	M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
			375.4 - Turbidimetric	RA	Relative Percent Difference (RPD) was not used for data validation because the sample concentration is too low for accurate evaluation (< 10x MDL).

SRK Consulting ACZ Project ID: ***L65087***

Wet Chemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Sulfate	375.4 - Turbidimetric

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L65087
Date Received: 9/18/2007
Received By:
Date Printed: 9/18/2007

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
1783	4.5	17

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L65087
Date Received: 9/18/2007
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L65087-01	SW08	Y	Y		Y		Y					
L65087-02	SW07	Y	Y		Y		Y					
L65087-03	TB-1	Y	Y		Y		Y					
L65087-04	SW09	Y	Y		Y		Y					
L65087-05	SW10	Y	Y		Y		Y					

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH-Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc. L65087

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: LARRY COPE
Company: SRK CONSULTING
E-mail: lcope@srk.com
Address: 19 OLD TOWN SQ, STE 238 FORT COLLINS, CO 80524
Telephone: 970-407-8302 XT 12

Copy of Report to:

Name: N/A
Company:
E-mail:
Telephone:

Invoice to:

Name: PAM PINSON/ACCOUNTS PAYABLE
Company: PHELPS DODGE MINING CO
E-mail: pam.pinson@FMI.COM
Address: CHINO MINES CO PO BOX 13308 PHOENIX, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses?
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

YES [X]
NO [ ]

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: O G01XB
Reporting state for compliance testing: NM
Sampler's Name: MIKE SIEBER
Are any samples NRC licensable material? No

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers	WET CHEMISTRY RAW	WET CHEMISTRY DISSOLVED	METALS TOTAL	METALS DISSOLVED	DOC, WET CHEM DISSOLVED	COD-TOC RAW		
SW08	9/14/07 10:30	SW	6	X	X	X	X	X	X		
SW07	9/14/07 11:45	SW	6	X	X	X	X	X	X		
TB-1	9/15/07 07:00	SW	6	X	X	X	X	X	X		
SW09	9/15/07 09:30	SW	6	X	X	X	X	X	X		
SW10	9/15/07 11:00	SW	6	X	X	X	X	X	X		

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
[illegible]	9-17-07 10:00	WPL	9-18-07 9:55

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

February 29, 2008

Report to:
Julie Sueker
Freeport-McMoRan - Chino Mines Company
14142 Denver W. Pkwy Suite 350
Golden, CO 80401

Bill to:
Accounts Payable Dept
Freeport-McMoRan - Chino Mines Company
P.O. Box 13308
Phoenix, AZ 85002-3308

cc: Larry Cope

Project ID: OG01XB
ACZ Project ID: L67712

Julie Sueker:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 16, 2008. This project has been assigned to ACZ's project number, L67712. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L67712. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 29, 2008. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl

Scott Habermehl has reviewed
and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: CDW-1-U

ACZ Sample ID: ***L67712-01***
Date Sampled: *02/12/08 00:00*
Date Received: *02/16/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.025			mg/L	0.001	0.005	02/20/08 22:39	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0009			mg/L	0.0001	0.0005	02/20/08 22:39	msh
Calcium, dissolved	M200.7 ICP	7.8		*	mg/L	0.2	1	02/20/08 1:40	aeh/wfg
Copper, dissolved	M200.8 ICP-MS	0.1240			mg/L	0.0005	0.003	02/20/08 22:39	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	02/20/08 1:40	aeh/wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	02/20/08 22:39	msh
Magnesium, dissolved	M200.7 ICP	2.0		*	mg/L	0.2	1	02/20/08 1:40	aeh/wfg
Manganese, dissolved	M200.8 ICP-MS	0.0365			mg/L	0.0005	0.003	02/20/08 22:39	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	28			mg/L	1	7	02/29/08 13:27	calc

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: ER-1-U

ACZ Sample ID: ***L67712-02***
Date Sampled: *02/14/08 00:00*
Date Received: *02/16/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.042			mg/L	0.001	0.005	02/20/08 22:44	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	02/20/08 22:44	msh
Calcium, dissolved	M200.7 ICP		U	*	mg/L	0.2	1	02/20/08 1:44	aeh/wfg
Copper, dissolved	M200.8 ICP-MS	0.0021	B		mg/L	0.0005	0.003	02/20/08 22:44	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	02/20/08 1:44	aeh/wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	02/20/08 22:44	msh
Magnesium, dissolved	M200.7 ICP		U	*	mg/L	0.2	1	02/20/08 1:44	aeh/wfg
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	02/20/08 22:44	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	02/29/08 13:27	calc

** Please refer to Qualifier Reports for details.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic QC Summary

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB

ACZ Project ID: ***L67712***

Aluminum, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240633													
WG240633ICV	ICV	02/20/08 20:04	MS080213-2	.1		.1079	mg/L	107.9	90	110			
WG240633ICB	ICB	02/20/08 20:09				U	mg/L		-0.003	0.003			
WG240633LFB	LFB	02/20/08 20:15	MS080125-9	.05		.0545	mg/L	109	85	115			
L67681-01AS	AS	02/20/08 21:43	MS080125-9	.05	.004	.0566	mg/L	105.2	70	130			
L67681-01ASD	ASD	02/20/08 21:49	MS080125-9	.05	.004	.0566	mg/L	105.2	70	130	0	20	

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240633													
WG240633ICV	ICV	02/20/08 20:04	MS080213-2	.05		.05335	mg/L	106.7	90	110			
WG240633ICB	ICB	02/20/08 20:09				U	mg/L		-0.0003	0.0003			
WG240633LFB	LFB	02/20/08 20:15	MS080125-9	.05		.05319	mg/L	106.4	85	115			
L67681-01AS	AS	02/20/08 21:43	MS080125-9	.05	U	.0555	mg/L	111	70	130			
L67681-01ASD	ASD	02/20/08 21:49	MS080125-9	.05	U	.05572	mg/L	111.4	70	130	0.4	20	

Calcium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240529													
WG240529ICV	ICV	02/19/08 23:43	II080115-3	100		96.83	mg/L	96.8	95	105			
WG240529ICB	ICB	02/19/08 23:46				U	mg/L		-0.6	0.6			
WG240529LFB	LFB	02/20/08 0:02	II080214-5	67.97008		68.62	mg/L	101	85	115			
L67710-08AS	AS	02/20/08 1:02	II080214-5	67.97008	519	520.24	mg/L	1.8	85	115			M3
L67710-08ASD	ASD	02/20/08 1:06	II080214-5	67.97008	519	537.39	mg/L	27.1	85	115	3.24	20	M3

Copper, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240633													
WG240633ICV	ICV	02/20/08 20:04	MS080213-2	.05		.05254	mg/L	105.1	90	110			
WG240633ICB	ICB	02/20/08 20:09				U	mg/L		-0.0015	0.0015			
WG240633LFB	LFB	02/20/08 20:15	MS080125-9	.05		.05177	mg/L	103.5	85	115			
L67681-01AS	AS	02/20/08 21:43	MS080125-9	.05	U	.04852	mg/L	97	70	130			
L67681-01ASD	ASD	02/20/08 21:49	MS080125-9	.05	U	.04886	mg/L	97.7	70	130	0.7	20	

Iron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240529													
WG240529ICV	ICV	02/19/08 23:43	II080115-3	2		1.958	mg/L	97.9	95	105			
WG240529ICB	ICB	02/19/08 23:46				U	mg/L		-0.06	0.06			
WG240529LFB	LFB	02/20/08 0:02	II080214-5	1		1.009	mg/L	100.9	85	115			
L67710-08AS	AS	02/20/08 1:02	II080214-5	1	U	.903	mg/L	90.3	85	115			
L67710-08ASD	ASD	02/20/08 1:06	II080214-5	1	U	.948	mg/L	94.8	85	115	4.86	20	

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Inorganic QC Summary

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB

ACZ Project ID: ***L67712***

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240633													
WG240633ICV	ICV	02/20/08 20:04	MS080213-2	.05		.05353	mg/L	107.1	90	110			
WG240633ICB	ICB	02/20/08 20:09				U	mg/L		-0.0003	0.0003			
WG240633LFB	LFB	02/20/08 20:15	MS080125-9	.05		.05195	mg/L	103.9	85	115			
L67681-01AS	AS	02/20/08 21:43	MS080125-9	.05	U	.0525	mg/L	105	70	130			
L67681-01ASD	ASD	02/20/08 21:49	MS080125-9	.05	U	.05258	mg/L	105.2	70	130	0.15	20	

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240529													
WG240529ICV	ICV	02/19/08 23:43	II080115-3	100		99.29	mg/L	99.3	95	105			
WG240529ICB	ICB	02/19/08 23:46				U	mg/L		-0.6	0.6			
WG240529LFB	LFB	02/20/08 0:02	II080214-5	54.96908		56.2	mg/L	102.2	85	115			
L67710-08AS	AS	02/20/08 1:02	II080214-5	54.96908	328	346.22	mg/L	33.1	85	115			M3
L67710-08ASD	ASD	02/20/08 1:06	II080214-5	54.96908	328	361.7	mg/L	61.3	85	115	4.37	20	M3

Manganese, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG240633													
WG240633ICV	ICV	02/20/08 20:04	MS080213-2	.05		.05383	mg/L	107.7	90	110			
WG240633ICB	ICB	02/20/08 20:09				U	mg/L		-0.0015	0.0015			
WG240633LFB	LFB	02/20/08 20:15	MS080125-9	.05		.053	mg/L	106	85	115			
L67681-01AS	AS	02/20/08 21:43	MS080125-9	.05	.0439	.09155	mg/L	95.3	70	130			
L67681-01ASD	ASD	02/20/08 21:49	MS080125-9	.05	.0439	.09244	mg/L	97.1	70	130	0.97	20	

ACZ Laboratories, Inc.
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Inorganic Extended Qualifier Report

Freeport-McMoRan - Chino Mines Company ACZ Project ID: ***L67712***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L67712-01	WG240529	Calcium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG240633	Lead, dissolved	M200.8 ICP-MS	BE	Target analyte in continuing calibration blank (CCB) at or above the acceptance criteria. Target analyte was not detected in the sample [< MDL].
	WG240529	Magnesium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
L67712-02	WG240529	Calcium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG240633	Lead, dissolved	M200.8 ICP-MS	BE	Target analyte in continuing calibration blank (CCB) at or above the acceptance criteria. Target analyte was not detected in the sample [< MDL].
	WG240529	Magnesium, dissolved	M200.7 ICP	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.

Certification Qualifiers

Freeport-McMoRan - Chino Mines Company ACZ Project ID: ***L67712***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.
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Sample Receipt

Freeport-McMoRan - Chino Mines Company
OG01XB

ACZ Project ID: L67712
Date Received: 2/16/2008
Received By:
Date Printed: 2/16/2008

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
NA5499	2.4	16

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Freeport-McMoRan - Chino Mines Company
OG01XB

ACZ Project ID: L67712
Date Received: 2/16/2008
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L67712-01	CDW-1-U		Y									
L67712-02	ER-1-U		Y									

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

L67712

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Julie Sneker
Company: ARCADIS BBL
E-mail: julie.sneker@arcadis-us.com
Address: 1442 Denver W. Parkway Suite 350 Golden, CO 80401
Telephone: 303-231-9115 X 112

Copy of Report to:

Name: Larry Cope
Company: SRK Consulting
E-mail: lcope@srk.com
Telephone: 970-407-8302

Invoice to:

Name: Pam Pinson
Company: Phelps/Dodge/Chino Mines Co.
E-mail: pam.pinson@fmi.com
Address: Chino Mines, CO, Box 13308 Phoenix, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES ☐ NO ☐
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: OG01XB
Reporting state for compliance testing: NM
Sampler's Name: Mike Sieber
Are any samples NRC licensable material? No

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers								
CDW-1-U	2-12-08	SW	1								
ER-1-U	2-14-08	SW	1								

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
[illegible]	2/14/08	MS	2-16-08 11:34

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

November 21, 2007

Report to:
Larry Cope
SRK Consulting
19 Old Twon Square Suite 238
Fort Coliins, CO 80524

Bill to:
Accounts Payable Dept
Phelps Dodge Mining Company
Chino Mines Company PO Box 13308
Phoenix, AZ 85002-3308

cc: Julie Sueker

Project ID: OG10XB
ACZ Project ID: L66007

Larry Cope:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on October 31, 2007. This project has been assigned to ACZ's project number, L66007. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L66007. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after December 21, 2007. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl 05/Oct/07

Scott Habermehl, Project Manager, has reviewed and approved this report in its entirety.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-03-U

ACZ Sample ID: ***L66007-01***
Date Sampled: *10/29/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.005			mg/L	0.001	0.005	11/07/07 5:04	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:29	msh
Calcium, dissolved	M200.7 ICP	24.3			mg/L	0.2	1	11/08/07 0:26	wfg
Copper, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:29	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:26	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:29	msh
Magnesium, dissolved	M200.7 ICP	7.0			mg/L	0.2	1	11/08/07 0:26	wfg
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	11/07/07 5:04	jjr

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	90			mg/L	1	7	11/21/07 13:46	calc

** Please refer to Qualifier Reports for details.*

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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-02-U

ACZ Sample ID: ***L66007-02***
Date Sampled: *10/25/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.003	B		mg/L	0.001	0.005	11/07/07 5:20	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:34	msh
Calcium, dissolved	M200.7 ICP	15.3			mg/L	0.2	1	11/08/07 0:30	wfg
Copper, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:34	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:30	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:34	msh
Magnesium, dissolved	M200.7 ICP	4.7			mg/L	0.2	1	11/08/07 0:30	wfg
Manganese, dissolved	M200.8 ICP-MS	0.0055			mg/L	0.0005	0.003	11/07/07 5:20	jjr

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	58			mg/L	1	7	11/21/07 13:46	calc

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-08-U

ACZ Sample ID: ***L66007-03***
Date Sampled: *10/11/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.003	B		mg/L	0.001	0.005	11/07/07 5:26	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:40	msh
Calcium, dissolved	M200.7 ICP	23.2			mg/L	0.2	1	11/08/07 0:34	wfg
Copper, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:40	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:34	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:40	msh
Magnesium, dissolved	M200.7 ICP	11.0			mg/L	0.2	1	11/08/07 0:34	wfg
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	11/07/07 5:26	jjr

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	103			mg/L	1	7	11/21/07 13:47	calc

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-12-U

ACZ Sample ID: ***L66007-04***
Date Sampled: *10/16/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.004	B		mg/L	0.001	0.005	11/07/07 5:31	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:46	msh
Calcium, dissolved	M200.7 ICP	17.0			mg/L	0.2	1	11/08/07 0:38	wfg
Copper, dissolved	M200.8 ICP-MS	0.0046			mg/L	0.0005	0.003	11/07/07 5:31	jjr
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:38	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:46	msh
Magnesium, dissolved	M200.7 ICP	1.8			mg/L	0.2	1	11/08/07 0:38	wfg
Manganese, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:46	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	50			mg/L	1	7	11/21/07 13:47	calc

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.
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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-01-U

ACZ Sample ID: ***L66007-05***
Date Sampled: *10/18/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS		U	*	mg/L	0.001	0.005	11/05/07 15:51	msh
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:51	msh
Calcium, dissolved	M200.7 ICP	9.0			mg/L	0.2	1	11/08/07 0:50	wfg
Copper, dissolved	M200.8 ICP-MS	0.0013	B		mg/L	0.0005	0.003	11/09/07 10:35	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:50	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:51	msh
Magnesium, dissolved	M200.7 ICP	3.8			mg/L	0.2	1	11/08/07 0:50	wfg
Manganese, dissolved	M200.8 ICP-MS	0.0025	B		mg/L	0.0005	0.003	11/09/07 10:35	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	38			mg/L	1	7	11/21/07 13:47	calc

** Please refer to Qualifier Reports for details.*

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Phelps Dodge Mining Company ACZ Project ID: ***L66007***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L66007-01	WG235601	Cadmium, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Copper, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Lead, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
L66007-02	WG235601	Cadmium, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Copper, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Lead, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
L66007-03	WG235601	Cadmium, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Copper, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Lead, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
L66007-04	WG235601	Cadmium, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Lead, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Manganese, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
L66007-05	WG235601	Aluminum, dissolved	M200.8 ICP-MS	LA	Recovery for target analyte in the control sample (LCS or LFB) exceeded the acceptance criteria. Target analyte was not detected in the sample [< MDL].
		Cadmium, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].
		Lead, dissolved	M200.8 ICP-MS	VC	CCV recovery was above the acceptance limits. Target analyte was not detected in the sample [< MDL].

Certification Qualifiers

Phelps Dodge Mining Company ACZ Project ID: ***L66007***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG10XB

ACZ Project ID: L66007
Date Received: 10/31/2007
Received By:
Date Printed: 10/31/2007

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
1345	3.1	16

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG10XB

ACZ Project ID: L66007
Date Received: 10/31/2007
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L66007-01	SW-03-U		Y									
L66007-02	SW-02-U		Y									
L66007-03	SW-08-U		Y									
L66007-04	SW-12-U		Y									
L66007-05	SW-01-U		Y									

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH-Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc. L606007

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Julie Sueker
Company: ARCADIS BBL
E-mail: julie.sueker@arcadis-us.com

Address: 14142 Denver W. Parkway Suite 350 Golden, CO 80401
Telephone: 303-231-9115 x 112

Copy of Report to:

Name: Larry Cope
Company: SRK Consulting

E-mail: lcope@srk.com
Telephone: 970-407-8302

Invoice to:

Name: Pam Pinson
Company: Phelps Dodge/Chino mines co.
E-mail: pam.pinson@fmi.com

Address: Chino Mines Co, Box 13308 Phoenix, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: OG01XB
Reporting state for compliance testing: NM
Sampler's Name: Mike Sieber
Are any samples NRC licensable material? No

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers								
SW03-U	10.29.07		1								
SW-02-U	10.25.07		1								
SW-08-U	10.11.07		1								
SW-12-U	10.16.07		1								
SW-01-U	10.18.07		1								
	↳ LZE 10.31.07		Per Sample Containers								

Matrix (SW (Surface Water)) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Kaelin Cauley	10/30/07 1pm	LWL	10-31-07 11:30

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

December 11, 2007

Report to:
Julie Sueker
Phelps Dodge Mining Company
14142 Denver W. Pkwy Suite 350
Golden, CO 80401

Bill to:
Pam Pinson
Phelps Dodge Mining Company
Chino Mines Company PO Box 7
Hurley, NM 88043

cc: Larry Cope

Project ID: OG01XB
ACZ Project ID: L66467

Julie Sueker:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on November 27, 2007. This project has been assigned to ACZ's project number, L66467. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L66467. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 11, 2008. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl 05/Oct/07

Scott Habermehl, Project Manager, has reviewed and approved this report in its entirety.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-04-U

ACZ Sample ID: ***L66467-01***
Date Sampled: *11/08/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.005			mg/L	0.001	0.005	11/29/07 14:02	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:02	msh
Calcium, dissolved	M200.7 ICP	27.0			mg/L	0.2	1	12/05/07 3:39	djt
Copper, dissolved	M200.8 ICP-MS	0.0201			mg/L	0.0005	0.003	11/29/07 14:02	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/05/07 3:39	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:02	msh
Magnesium, dissolved	M200.7 ICP	2.1			mg/L	0.2	1	12/05/07 3:39	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	11/29/07 14:02	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	76			mg/L	1	7	12/11/07 15:30	calc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-05-U

ACZ Sample ID: ***L66467-02***
Date Sampled: *11/08/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	10.00			mg/L	0.05	0.3	11/30/07 23:59	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0039			mg/L	0.0001	0.0005	11/29/07 14:08	msh
Calcium, dissolved	M200.7 ICP	69.9			mg/L	0.2	1	12/05/07 3:43	djt
Copper, dissolved	M200.8 ICP-MS	1.14			mg/L	0.03	0.1	11/30/07 23:59	msh
Iron, dissolved	M200.7 ICP	0.09			mg/L	0.02	0.05	12/05/07 3:43	djt
Lead, dissolved	M200.8 ICP-MS	0.0004	B		mg/L	0.0001	0.0005	11/29/07 14:08	msh
Magnesium, dissolved	M200.7 ICP	47.0			mg/L	0.2	1	12/05/07 3:43	djt
Manganese, dissolved	M200.8 ICP-MS	4.28			mg/L	0.03	0.1	11/30/07 23:59	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	368			mg/L	1	7	12/11/07 15:30	calc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-09-U

ACZ Sample ID: ***L66467-03***
Date Sampled: *11/11/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.013			mg/L	0.001	0.005	11/29/07 14:14	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:14	msh
Calcium, dissolved	M200.7 ICP	24.8			mg/L	0.2	1	12/05/07 3:48	djt
Copper, dissolved	M200.8 ICP-MS	0.0020	B		mg/L	0.0005	0.003	11/29/07 14:14	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/05/07 3:48	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:14	msh
Magnesium, dissolved	M200.7 ICP	11.3			mg/L	0.2	1	12/05/07 3:48	djt
Manganese, dissolved	M200.8 ICP-MS	0.0287			mg/L	0.0005	0.003	11/29/07 14:14	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	108			mg/L	1	7	12/11/07 15:30	calc

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-10-U

ACZ Sample ID: ***L66467-04***
Date Sampled: *11/15/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.009			mg/L	0.001	0.005	11/29/07 14:25	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:25	msh
Calcium, dissolved	M200.7 ICP	15.4			mg/L	0.2	1	12/05/07 3:52	djt
Copper, dissolved	M200.8 ICP-MS	0.0009	B		mg/L	0.0005	0.003	11/29/07 14:25	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/05/07 3:52	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:25	msh
Magnesium, dissolved	M200.7 ICP	6.6			mg/L	0.2	1	12/05/07 3:52	djt
Manganese, dissolved	M200.8 ICP-MS	0.0013	B		mg/L	0.0005	0.003	11/29/07 14:25	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	66			mg/L	1	7	12/11/07 15:30	calc

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5) EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6) Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3) Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Extended Qualifier Report

Phelps Dodge Mining Company ACZ Project ID: ***L66467***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION

No extended qualifiers associated with this analysis

Certification Qualifiers

Phelps Dodge Mining Company ACZ Project ID: ***L66467***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L66467
Date Received: 11/27/2007
Received By:
Date Printed: 11/27/2007

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

A sample date was not present on the chain of custody for any of the samples. The sample date was entered according to the sample container. The 1st sample did not have a sample date on the container, a sample date of 11/8/07 was used.

Contact (For any discrepancies, the client must be contacted)

The client was not contacted.

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
1378	3.6	15

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG01XB

ACZ Project ID: L66467
Date Received: 11/27/2007
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L66467-01	SW-04-U		Y									
L66467-02	SW-05-U		Y									
L66467-03	SW-09-U		Y									
L66467-04	SW-10-U		Y									

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH-Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc. L66467

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Julie Sueker
Company: ARCADIS BBL
E-mail: julie.sueker@arcadis-us.com
Address: 14142 Denver W. Parkway Suite 350 Golden, CO 80401
Telephone: 303-231-9115 x112

Copy of Report to:

Name: Larry Cope
Company: SRK consulting
E-mail: lcope@srk.com
Telephone: 970-407-8307

Invoice to:

Name: Pam Pinson
Company: Phelps/Dodge/Chino mines co.
E-mail: pam.pinson@fmi.com
Address: Chino Mines Co, Box 13308 Phoenix, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #: ARCADIS - STUDY
Project/PO #: 0G01XB
Reporting state for compliance testing: NM
Sampler's Name: Mike Sieber
Are any samples NRC licensable material? NO

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers
SW-04-U	11.8.07		1
SW-05-U	11.8.07		1
SW-09-U	11.11.07		1
SW-10-U	11.15.07		1
	↳ LB 11.27.07		

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Kaelin Cawley	11/26/07:12:40pm	LBB	11.27.07 11:01

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

December 27, 2007

Report to:
Julie Sueker
Freeport-McMoRan - Chino Mines Company
14142 Denver W. Pkwy Suite 350
Golden, CO 80401

Bill to:
Pam Pinson
Freeport-McMoRan - Chino Mines Company
P.O. Box 13308
Phoenix, AZ 85002-3308

cc: Larry Cope

Project ID: OG10XB
ACZ Project ID: L66778

Julie Sueker:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on December 14, 2007. This project has been assigned to ACZ's project number, L66778. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L66778. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after January 27, 2008. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl 05/Oct/07

Scott Habermehl, Project Manager, has reviewed and approved this report in its entirety.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW312-U

ACZ Sample ID: ***L66778-01***
Date Sampled: *11/29/07 12:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.007			mg/L	0.001	0.005	12/17/07 23:22	gme/scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/17/07 23:22	gme/scp
Calcium, dissolved	M200.7 ICP	17.1			mg/L	0.2	1	12/20/07 3:01	djt
Copper, dissolved	M200.8 ICP-MS	0.0148			mg/L	0.0005	0.003	12/19/07 12:42	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:01	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 12:42	gme/scp
Magnesium, dissolved	M200.7 ICP	1.9			mg/L	0.2	1	12/20/07 3:01	djt
Manganese, dissolved	M200.8 ICP-MS	0.0006	B		mg/L	0.0005	0.003	12/17/07 23:22	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	51			mg/L	1	7	12/27/07 15:00	calc

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: TB-1-U

ACZ Sample ID: ***L66778-02***
Date Sampled: *12/02/07 00:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.002	B		mg/L	0.001	0.005	12/17/07 23:39	gme/scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/17/07 23:39	gme/scp
Calcium, dissolved	M200.7 ICP		U		mg/L	0.2	1	12/20/07 3:14	djt
Copper, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	12/19/07 12:48	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:14	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 12:48	gme/scp
Magnesium, dissolved	M200.7 ICP		U		mg/L	0.2	1	12/20/07 3:14	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	12/17/07 23:39	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	12/27/07 15:00	calc

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW11-U

ACZ Sample ID: ***L66778-03***
Date Sampled: *12/07/07 00:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.009			mg/L	0.001	0.005	12/17/07 23:45	gme/scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/17/07 23:45	gme/scp
Calcium, dissolved	M200.7 ICP	12.7			mg/L	0.2	1	12/20/07 3:26	djt
Copper, dissolved	M200.8 ICP-MS	0.0073			mg/L	0.0005	0.003	12/19/07 12:54	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:26	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 12:54	gme/scp
Magnesium, dissolved	M200.7 ICP	1.7			mg/L	0.2	1	12/20/07 3:26	djt
Manganese, dissolved	M200.8 ICP-MS	0.0015	B		mg/L	0.0005	0.003	12/17/07 23:45	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	39			mg/L	1	7	12/27/07 15:00	calc

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW14-U

ACZ Sample ID: ***L66778-04***
Date Sampled: *12/13/07 12:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.003	B		mg/L	0.001	0.005	12/17/07 23:51	gme/scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/17/07 23:51	gme/scp
Calcium, dissolved	M200.7 ICP	6.4			mg/L	0.2	1	12/20/07 3:30	djt
Copper, dissolved	M200.8 ICP-MS	0.0097			mg/L	0.0005	0.003	12/19/07 13:10	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:30	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 13:10	gme/scp
Magnesium, dissolved	M200.7 ICP	1.8			mg/L	0.2	1	12/20/07 3:30	djt
Manganese, dissolved	M200.8 ICP-MS	0.0014	B		mg/L	0.0005	0.003	12/17/07 23:51	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	23			mg/L	1	7	12/27/07 15:00	calc

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW15-U

ACZ Sample ID: ***L66778-05***
Date Sampled: *12/10/07 09:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.002	B		mg/L	0.001	0.005	12/17/07 23:57	gme/scp
Cadmium, dissolved	M200.8 ICP-MS	0.0004	B		mg/L	0.0001	0.0005	12/17/07 23:57	gme/scp
Calcium, dissolved	M200.7 ICP	12.7			mg/L	0.2	1	12/20/07 3:34	djt
Copper, dissolved	M200.8 ICP-MS	0.0094			mg/L	0.0005	0.003	12/19/07 13:16	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:34	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 13:16	gme/scp
Magnesium, dissolved	M200.7 ICP	4.2			mg/L	0.2	1	12/20/07 3:34	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	12/17/07 23:57	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	49			mg/L	1	7	12/27/07 15:00	calc

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

Freeport-McMoRan - Chino Mines Company

ACZ Project ID: ***L66778***

Project ID: OG10XB

Aluminum, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG237973													
WG237973ICV	ICV	12/17/07 21:12	MS071207-2	.1		.1026	mg/L	102.6	90	110			
WG237973ICB	ICB	12/17/07 21:18				U	mg/L		-0.003	0.003			
WG237973LFB	LFB	12/17/07 21:24	MS071113-5	.05		.0538	mg/L	107.6	85	115			
L66773-05AS	AS	12/17/07 22:58	MS071113-5	.05	.009	.0564	mg/L	94.8	70	130			
L66773-05ASD	ASD	12/17/07 23:04	MS071113-5	.05	.009	.0552	mg/L	92.4	70	130	2.15	20	

Cadmium, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG237973													
WG237973ICV	ICV	12/17/07 21:12	MS071207-2	.05		.05023	mg/L	100.5	90	110			
WG237973ICB	ICB	12/17/07 21:18				U	mg/L		-0.0003	0.0003			
WG237973LFB	LFB	12/17/07 21:24	MS071113-5	.05		.05069	mg/L	101.4	85	115			
L66773-05AS	AS	12/17/07 22:58	MS071113-5	.05	U	.0527	mg/L	105.4	70	130			
L66773-05ASD	ASD	12/17/07 23:04	MS071113-5	.05	U	.05227	mg/L	104.5	70	130	0.82	20	

Calcium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG238150													
WG238150ICV	ICV	12/20/07 1:39	II071009-7	100		96.1	mg/L	96.1	95	105			
WG238150ICB	ICB	12/20/07 1:43				U	mg/L		-0.6	0.6			
WG238150LFB	LFB	12/20/07 1:59	II071219-3	67.97008		72.26	mg/L	106.3	85	115			
L66778-01AS	AS	12/20/07 3:05	II071219-3	67.97008	17.1	91.06	mg/L	108.8	85	115			
L66778-01ASD	ASD	12/20/07 3:10	II071219-3	67.97008	17.1	89.94	mg/L	107.2	85	115	1.24	20	

Copper, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG238076													
WG238076ICV	ICV	12/19/07 10:44	MS071207-2	.05		.05244	mg/L	104.9	90	110			
WG238076ICB	ICB	12/19/07 10:50				U	mg/L		-0.0015	0.0015			
WG238076LFB	LFB	12/19/07 10:56	MS071113-5	.05		.0497	mg/L	99.4	85	115			
L66774-01AS	AS	12/19/07 12:26	MS071113-5	.05	.0018	.05031	mg/L	97	70	130			
L66774-01ASD	ASD	12/19/07 12:31	MS071113-5	.05	.0018	.04951	mg/L	95.4	70	130	1.6	20	

Iron, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG238150													
WG238150ICV	ICV	12/20/07 1:39	II071009-7	2		1.958	mg/L	97.9	95	105			
WG238150ICB	ICB	12/20/07 1:43				U	mg/L		-0.06	0.06			
WG238150LFB	LFB	12/20/07 1:59	II071219-3	1		.994	mg/L	99.4	85	115			
L66778-01AS	AS	12/20/07 3:05	II071219-3	1	U	1.028	mg/L	102.8	85	115			
L66778-01ASD	ASD	12/20/07 3:10	II071219-3	1	U	1.017	mg/L	101.7	85	115	1.08	20	

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Inorganic QC Summary

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB

ACZ Project ID: ***L66778***

Lead, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG238076													
WG238076ICV	ICV	12/19/07 10:44	MS071207-2	.05		.05323	mg/L	106.5	90	110			
WG238076ICB	ICB	12/19/07 10:50				U	mg/L		-0.0003	0.0003			
WG238076LFB	LFB	12/19/07 10:56	MS071113-5	.05		.0501	mg/L	100.2	85	115			
L66774-01AS	AS	12/19/07 12:26	MS071113-5	.05	U	.05129	mg/L	102.6	70	130			
L66774-01ASD	ASD	12/19/07 12:31	MS071113-5	.05	U	.05026	mg/L	100.5	70	130	2.03	20	

Magnesium, dissolved M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG238150													
WG238150ICV	ICV	12/20/07 1:39	II071009-7	100		98.38	mg/L	98.4	95	105			
WG238150ICB	ICB	12/20/07 1:43				U	mg/L		-0.6	0.6			
WG238150LFB	LFB	12/20/07 1:59	II071219-3	54.96908		58.41	mg/L	106.3	85	115			
L66778-01AS	AS	12/20/07 3:05	II071219-3	54.96908	1.9	62.65	mg/L	110.5	85	115			
L66778-01ASD	ASD	12/20/07 3:10	II071219-3	54.96908	1.9	61.9	mg/L	109.2	85	115	1.2	20	

Manganese, dissolved M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
WG237973													
WG237973ICV	ICV	12/17/07 21:12	MS071207-2	.05		.05515	mg/L	110.3	90	110			
WG237973ICB	ICB	12/17/07 21:18				U	mg/L		-0.0015	0.0015			
WG237973LFB	LFB	12/17/07 21:24	MS071113-5	.05		.05484	mg/L	109.7	85	115			
L66773-05AS	AS	12/17/07 22:58	MS071113-5	.05	.0771	.1279	mg/L	101.6	70	130			
L66773-05ASD	ASD	12/17/07 23:04	MS071113-5	.05	.0771	.1275	mg/L	100.8	70	130	0.31	20	

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Inorganic Extended Qualifier Report

Freeport-McMoRan - Chino Mines Company ACZ Project ID: ***L66778***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION

No extended qualifiers associated with this analysis

Certification Qualifiers

Freeport-McMoRan - Chino Mines Company ACZ Project ID: ***L66778***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG10XB

ACZ Project ID: L66778
Date Received: 12/14/2007
Received By:
Date Printed: 12/14/2007

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
NA5146	2.3	15

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Sample Receipt

Phelps Dodge Mining Company
OG10XB

ACZ Project ID: L66778
Date Received: 12/14/2007
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L66778-01	SW312-U		Y									
L66778-02	TB-1-U		Y									
L66778-03	SW11-U		Y									
L66778-04	SW14-U		Y									
L66778-05	SW15-U		Y									

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH-Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc. L66778

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Julie Sueker
Company: ARCADIS BBL
E-mail: julie.sueker@arcadis-us.com
Address: 14142 Denver W. Parkway Suite 350 Golden, CO 80401
Telephone: 303-231-9115 x112

Copy of Report to:

Name: Larry Cope
Company: SRK consulting
E-mail: lcope@srk.com
Telephone: 970-407-8802

Invoice to:

Name: Pam Pinson
Company: Phelps/Dodge/Chino mines co.
E-mail: pam.pinson@fmi.com
Address: Chino mines, co, Box 13308 Phoenix, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: OG01XB
Reporting state for compliance testing: NM
Sampler's Name: Mike Sieber
Are any samples NRC licensable material? NO

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers
SW312-U	11.29.07 12:00		1
TB-1-U	12.2.07		1
SW11-U	12.7.07		1
SW14-U	12.13.07 12:00		1
SW15-U	12.10.07 9:00		1
	LR 12.14.07		

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Kelly Cawley	12/13/07 3pm	LR	12/14/07 11:49 WPL 12-14-07

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Analytical Report

February 05, 2008

Report to:
Julie Sueker
Freeport-McMoRan - Chino Mines Company
14142 Denver W. Pkwy Suite 350
Golden, CO 80401

Bill to:
Pam Pinson
Freeport-McMoRan - Chino Mines Company
P.O. Box 13308
Phoenix, AZ 85002-3308

cc: Larry Cope

Project ID: OG01XB
ACZ Project ID: L67069

Julie Sueker:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on January 08, 2008. This project has been assigned to ACZ's project number, L67069. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan, version 12.0. The enclosed results relate only to the samples received under L67069. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after March 05, 2008. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than $10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.

S. Habermehl

Scott Habermehl has reviewed
and approved this report.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: SW-07-U

ACZ Sample ID: ***L67069-01***
Date Sampled: *12/29/07 00:00*
Date Received: *01/08/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.016			mg/L	0.001	0.005	01/10/08 1:00	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	01/10/08 1:00	msh
Calcium, dissolved	M200.7 ICP	19.5			mg/L	0.2	1	01/09/08 20:33	djt
Copper, dissolved	M200.8 ICP-MS	0.0022	B		mg/L	0.0005	0.003	01/10/08 1:00	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	01/08/08 20:47	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	01/10/08 1:00	msh
Magnesium, dissolved	M200.7 ICP	9.0			mg/L	0.2	1	01/09/08 20:33	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	01/10/08 1:00	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	86			mg/L	1	7	02/05/08 0:00	calc

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: SW-313-U

ACZ Sample ID: ***L67069-02***
Date Sampled: *01/06/08 00:00*
Date Received: *01/08/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.004	B		mg/L	0.001	0.005	01/10/08 1:06	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0003	B		mg/L	0.0001	0.0005	01/10/08 1:06	msh
Calcium, dissolved	M200.7 ICP	15.7			mg/L	0.2	1	01/09/08 20:43	djt
Copper, dissolved	M200.8 ICP-MS	0.0024	B		mg/L	0.0005	0.003	01/10/08 1:06	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	01/08/08 20:50	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	01/10/08 1:06	msh
Magnesium, dissolved	M200.7 ICP	4.9			mg/L	0.2	1	01/09/08 20:43	djt
Manganese, dissolved	M200.8 ICP-MS	0.200			mg/L	0.003	0.01	01/15/08 20:47	gme

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	59			mg/L	1	7	02/05/08 0:00	calc

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: SW-13-U

ACZ Sample ID: ***L67069-03***
Date Sampled: *01/03/08 00:00*
Date Received: *01/08/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.002	B	*	mg/L	0.001	0.005	01/10/08 1:12	msh
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	01/10/08 1:12	msh
Calcium, dissolved	M200.7 ICP	23.6		*	mg/L	0.2	1	01/09/08 20:54	djt
Copper, dissolved	M200.8 ICP-MS	0.0081		*	mg/L	0.0005	0.003	01/10/08 1:12	msh
Iron, dissolved	M200.7 ICP		U	*	mg/L	0.02	0.05	01/08/08 20:54	djt
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	01/10/08 1:12	msh
Magnesium, dissolved	M200.7 ICP	2.4		*	mg/L	0.2	1	01/09/08 20:54	djt
Manganese, dissolved	M200.8 ICP-MS	0.0007	B	*	mg/L	0.0005	0.003	01/10/08 1:12	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	69			mg/L	1	7	02/05/08 0:00	calc

** Please refer to Qualifier Reports for details.*

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: BDW-4-U

ACZ Sample ID: ***L67069-04***
Date Sampled: *12/25/07 00:00*
Date Received: *01/08/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.012			mg/L	0.001	0.005	01/10/08 1:18	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0004	B		mg/L	0.0001	0.0005	01/10/08 1:18	msh
Calcium, dissolved	M200.7 ICP	16.8			mg/L	0.2	1	01/09/08 20:58	djt
Copper, dissolved	M200.8 ICP-MS	0.0044			mg/L	0.0005	0.003	01/10/08 1:18	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	01/08/08 20:57	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	01/10/08 1:18	msh
Magnesium, dissolved	M200.7 ICP	5.1			mg/L	0.2	1	01/09/08 20:58	djt
Manganese, dissolved	M200.8 ICP-MS	0.207			mg/L	0.003	0.01	01/15/08 20:53	gme

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	63			mg/L	1	7	02/05/08 0:00	calc

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: SW06-U

ACZ Sample ID: ***L67069-05***
Date Sampled: *12/20/07 00:00*
Date Received: *01/08/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.014			mg/L	0.001	0.005	01/10/08 1:23	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	01/10/08 1:23	msh
Calcium, dissolved	M200.7 ICP	4.1			mg/L	0.2	1	01/09/08 21:02	djt
Copper, dissolved	M200.8 ICP-MS	0.0030			mg/L	0.0005	0.003	01/10/08 1:23	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	01/08/08 21:00	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	01/10/08 1:23	msh
Magnesium, dissolved	M200.7 ICP	1.9			mg/L	0.2	1	01/09/08 21:02	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	01/10/08 1:23	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	18			mg/L	1	7	02/05/08 0:00	calc

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LCSWD*	Laboratory Control Sample - Water Duplicate
ASD	Analytical Spike (Post Digestion) Duplicate	*LFB*	Laboratory Fortified Blank
CCB	Continuing Calibration Blank	*LFM*	Laboratory Fortified Matrix
CCV	Continuing Calivation Verification standard	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
ICB	Initial Calibration Blank	*MS*	Matrix Spike
ICV	Initial Calibration Verification standard	*MSD*	Matrix Spike Duplicate
ICSAB	Inter-element Correction Standard - A plus B solutions	*PBS*	Prep Blank - Soil
LCSS	Laboratory Control Sample - Soil	*PBW*	Prep Blank - Water
LCSSD	Laboratory Control Sample - Soil Duplicate	*PQV*	Practical Quantitation Verification standard
LCSW	Laboratory Control Sample - Water	*SDL*	Serial Dilution

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
U	Analyte was analyzed for but not detected at the indicated MDL

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
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Inorganic Extended Qualifier Report

Freeport-McMoRan - Chino Mines Company ACZ Project ID: ***L67069***

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L67069-03	WG238826	Aluminum, dissolved	M200.8 ICP-MS	H3	Sample was received and analyzed past holding time.
		Cadmium, dissolved	M200.8 ICP-MS	H3	Sample was received and analyzed past holding time.
	WG238838	Calcium, dissolved	M200.7 ICP	H3	Sample was received and analyzed past holding time.
	WG238826	Copper, dissolved	M200.8 ICP-MS	H3	Sample was received and analyzed past holding time.
	WG238799	Iron, dissolved	M200.7 ICP	H3	Sample was received and analyzed past holding time.
	WG238826	Lead, dissolved	M200.8 ICP-MS	H3	Sample was received and analyzed past holding time.
	WG238838	Magnesium, dissolved	M200.7 ICP	H3	Sample was received and analyzed past holding time.
	WG238826	Manganese, dissolved	M200.8 ICP-MS	H3	Sample was received and analyzed past holding time.

Certification Qualifiers

Freeport-McMoRan - Chino Mines Company ACZ Project ID: ***L67069***

No certification qualifiers associated with this analysis

ACZ Laboratories, Inc.
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Sample Receipt

Freeport-McMoRan - Chino Mines Company
OG01XB

ACZ Project ID: L67069
Date Received: 1/8/2008
Received By:
Date Printed: 1/29/2008

Receipt Verification

	YES	NO	NA
1) Does this project require special handling procedures such as CLP protocol?			X
2) Are the custody seals on the cooler intact?	X		
3) Are the custody seals on the sample containers intact?			X
4) Is there a Chain of Custody or other directive shipping papers present?	X		
5) Is the Chain of Custody complete?	X		
6) Is the Chain of Custody in agreement with the samples received?	X		
7) Is there enough sample for all requested analyses?	X		
8) Are all samples within holding times for requested analyses?	X		
9) Were all sample containers received intact?	X		
10) Are the temperature blanks present?			X
11) Are the trip blanks (VOA and/or Cyanide) present?			X
12) Are samples requiring no headspace, headspace free?			X
13) Do the samples that require a Foreign Soils Permit have one?			X

Exceptions: If you answered no to any of the above questions, please describe

N/A

Contact (For any discrepancies, the client must be contacted)

N/A

Shipping Containers

Cooler Id	Temp (°C)	Rad (µR/hr)
NA5264	2.1	15

Client must contact ACZ Project Manager if analysis should not proceed for samples received outside of thermal preservation acceptance criteria.

Notes

ACZ Laboratories, Inc.
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Sample Receipt

Freeport-McMoRan - Chino Mines Company
OG01XB

ACZ Project ID: L67069
Date Received: 1/8/2008
Received By:

Sample Container Preservation

SAMPLE	CLIENT ID	R < 2	G < 2	BK < 2	Y< 2	YG< 2	B< 2	O < 2	T >12	N/A	RAD	ID
L67069-01	SW-07-U		Y									
L67069-02	SW-313-U		Y									
L67069-03	SW-13-U		Y									
L67069-04	BDW-4-U		Y									
L67069-05	SW06-U		Y									

Sample Container Preservation Legend

Abbreviation	Description	Container Type	Preservative/Limits
R	Raw/Nitric	RED	pH must be < 2
B	Filtered/Sulfuric	BLUE	pH must be < 2
BK	Filtered/Nitric	BLACK	pH must be < 2
G	Filtered/Nitric	GREEN	pH must be < 2
O	Raw/Sulfuric	ORANGE	pH must be < 2
P	Raw/NaOH	PURPLE	pH must be > 12 *
T	Raw/NaOH Zinc Acetate	TAN	pH must be > 12
Y	Raw/Sulfuric	YELLOW	pH must be < 2
YG	Raw/Sulfuric	YELLOW GLASS	pH must be < 2
N/A	No preservative needed	Not applicable	
RAD	Gamma/Beta dose rate	Not applicable	must be < 250 µR/hr

* pH check performed by analyst prior to sample preparation

Sample IDs Reviewed By: _____

ACZ Laboratories, Inc. L67069

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

CHAIN of CUSTODY

Report to:

Name: Julie Sueker
Company: ARCADIS BBL
E-mail: julie.sueker@arcadis-us.com
Address: 14142 Denver W. PKWY Suite 350 Golden, CO 80401
Telephone: 303-231-9115 x112

Copy of Report to:

Name: Larry Cope
Company: SRK consulting
E-mail: lcope@srk.com
Telephone: 970-407-8302

Invoice to:

Name: Pam Pinson
Company: Phelps/Dodge/Chino mines
E-mail: pam.pinson@fmi.com
Address: Chino mines, CO, BOX 13308 Phoenix, AZ 85002-3308
Telephone: 505-537-4213

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]
If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

PROJECT INFORMATION

Quote #: ARCADIS-STUDY
Project/PO #: 0601XB
Reporting state for compliance testing: NM
Sampler's Name: Mike Sieber
Are any samples NRC licensable material? no

ANALYSES REQUESTED *(attach list or use quote number)*

SAMPLE IDENTIFICATION	DATE:TIME	Matrix	# of Containers
SW-07-U	12.29.07		1
SW-313-U	1.6.08		1
SW-13-U	1.3.07		1
BDW-4-U	12.25.07		1
SW06-U	12.20.07		1

→ 1.8.08 per sample containers

Matrix: SW (Surface Water) · GW (Ground Water) · WW (Waste Water) · DW (Drinking Water) · SL (Sludge) · SO (Soil) · OL (Oil) · Other

REMARKS/ SAMPLE DISCLOSURES

PAGE of

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

RELINQUISHED BY:	DATE:TIME	RECEIVED BY:	DATE:TIME
Karlie Cauley	1/7/08	5:15pm	
		LAL	1-8-08 10:53

FRMAD050.03.05.02 White - Return with sample. Yellow - Retain for your records.

APPENDIX C

Data Validation and Data Quality Assessment Reports

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1. INTRODUCTION

This Data Quality Assessment Report (DQAR) is the written record of the reconciliation of the analytical data quality with the end use of the data and specific project objectives for the Smelter Tailings Soil Investigation Unit (SmTSIU). The data were reviewed in accordance with the approved Quality Assurance Plan (QAP) prepared by Chino Mines Company and Steffen, Robertson and Kirsten (U.S.), Inc. (March 1997).

The samples were collected in September 2007 through December 2007. The samples were sent to ACZ Laboratories, Inc. in Steamboat, Colorado for analysis. Samples with the suffix "U" at the end of the client ID were ultra filtered using a 0.001 um filter. The ultra filtration was a slow process conducted by CU INSTAARS laboratory in Boulder, Colorado. The filtrate was then shipped to ACZ for analysis. The samples were analyzed for the following parameters: dissolved metals and hardness as $CaCO_3$. The other filtered samples were filtered using a 0.45 um filter in the field. Samples other than those filtered through a 0.001 um filter were analyzed for the following parameters: total phosphorus, total and dissolved metals, alkalinities, dissolved organic carbon, total organic carbon, chloride, hardness as CaCO3, nitrate/nitrite as N, and sulfate.

TABLE 1-1

SURFACE WATER SAMPLES COLLECTED

Data Package	Field Sample Identification	QC Designation
L65006	SW01	MD – Alkalinity as CaCO3, Chloride, Sulfate MS - DOC MS/MSD – Dissolved Potassium
	SW02	MD – DOC
	SW03	
	SW05	
	SW06A	MS - TOC
L65029	CDW-1	MS/MSD – Total Iron MS – DOC, TOC
	SW12	MS/MSD – Total Aluminum, Total Cadmium, Total Copper, Total Lead, Total Manganese MS - Total Phosphorus
	SW312	MD – Total Phosphorus FD to sample SW12
	SW11	MD – Alkalinity as CaCO3
	SW13	MS/MSD – Dissolved Aluminum, Dissolved Calcium, Dissolved Copper, Dissolved Lead, Dissolved Manganese MS – Nitrate/Nitrite as N
	SW14	MD – DOC, Chloride, Nitrate/ Nitrite as N MS – Chloride
L65087	SW08	MS/MSD – Dissolved Calcium, Dissolved Iron, Dissolved Magnesium, Dissolved Potassium, Dissolved Sodium
	SW07	MS/MSD – Total Cadmium, Total Copper, Total Lead, Total Manganese MS – TOC, Sulfate
	TB-1	MS/MSD – Total Aluminum MD – TOC, Sulfate MS – Nitrate/Nitrite as N
	SW09	MD – Alkalinity as CaCO3, Nitrate/ Nitrite as N
	SW10	MS/MSD – Dissolved Aluminum, Dissolved Cadmium, Dissolved Copper, Dissolved Lead, Dissolved Manganese
L65088	BDLU-4	MS/MSD – Total Iron
	SW313	
	SW15	
	SW04	MS – Total Phosphorus, DOC, Chloride
	ER-1	MD – DOC, Chloride, Total Phosphorus

TABLE 1-1

SURFACE WATER SAMPLES COLLECTED

Data Package	Field Sample Identification	QC Designation
L66007	SW-06-U	
	SW-02-U	
	SW-08-U	
	SW-12-U	
	SW-01-U	
L66467	SW-04-U	
	SW-05-U	
	SW-09-U	
	SW-10-U	
L66778	SW-312-U	MS/MSD – Dissolved Calcium, Dissolved Iron, Dissolved Magnesium
	TB-1-U	
	SW11-U	
	SW14-U	
	SW-15-U	
L67069	SW-07-U	
	SW-313-U	
	SW-13-U	
	BDW-4-U	
	SW06-D	
L67712	CDW-1-U	
	ER-1-U	

TOC – Total Organic Carbon DOC – Dissolved Organic Carbon TSS – Total Suspended Solids
QC – quality control MS/MSD – Matrix Spike/Matrix Spike Duplicate MD – Method Duplicate

The data were reviewed in accordance with the approved Administrative Order on Consent Quality Assurance Plan (QAP). The data were evaluated against the quantitative acceptance limits prescribed by the QAP for the data quality assurance parameters of reporting limits (RLs) (QAP-specified RLs were superseded by FSP required RLs), accuracy, precision, and completeness. The data were also evaluated for fulfillment of the qualitative data quality assurance parameters of representative and comparability as defined in the QAP.

The data validation results are presented in the Data Validation Report for SmTSIU for Surface Water Samples (URS, May - 2008). The data validation report, on which this DQAR is based, contains a detailed narrative in which all results that did not satisfy the data quality assurance objectives in the QAP and the subsequent data qualification issued, if any, are described.

The DQAR is organized as follows and includes the required elements listed in Section 15 of the QAP. Section 2.0 provides a detailed discussion of the usability of the data relative to the intended end uses (project objectives). In order to facilitate this discussion, the project objectives and decision criteria are also summarized in this section. Section 3.0 provides recommendations for usability in potential additional data uses and limitations in data uses. Section 4.0 provides a brief summary of the results obtained for the data quality assurance objectives. Section 5.0 discusses corrective actions implemented and deviations from the Field Sampling Plan. Section 6.0 provides a summary of all instances where the data were considered inadequate for use in satisfying project objectives (DQOs) and the significance of the problems, if any. Conclusions are presented in Section 7.0.

2. DATA USABILITY RELATIVE TO PROJECT OBJECTIVES

The usability of the sample data relative to the intended end uses is discussed in this section. The purpose of the sampling event was to provide data to compare to the Environmental Protection Agency Safe Drinking Water Act Maximum Contamination Levels (EPA SDWA MCLs).

Objective: Comparison of total and dissolved concentrations for both 0.45 and 0.100 µm filtered samples for surface water samples to the standards.

Decision: Do concentrations of constituents exceed decision criteria?

Criteria: The EPA MCLs will be used as the decision criteria for both types of filtered samples and for total metals samples.

In order to evaluate the usability of the data for meeting project objectives, the data must be reconciled with project objectives and decision criteria, as applicable. Only data considered to be valid, as determined through data validation, may be considered for reconciliation with project objectives. Thus, a summary of data validation results is provided in Section 2.1 below.

For the comparison to the decision criteria for surface water samples, the reconciliation process begins with a comparison of the reporting limits obtained to the decision criteria. In general, for data to be considered usable for making project decisions, the reporting limit obtained for each analyte must be less than or equal to the decision criterion. However, analyte results for which the reporting limit is greater than the decision criterion may be usable if the sample results obtained were positive or if the reporting limit is less than the decision criterion. Nondetect results at reporting limits which exceed decision criteria are not sufficient for making project decisions based on those criteria. With this in mind, the reporting limits obtained for samples collected are compared to the applicable standards in Section 2.2.

After evaluating the usability of the data with respect to reporting limits obtained and project decision criteria, any potential biases and imprecision in results suggested by QC results must be assessed in order to evaluate the ultimate usability of the data for making decisions. Potential biases and imprecision in analytical results and data usability are discussed in Section 2.3.

Four field duplicate pairs (two for the 0.45 µm filtered and unfiltered metals and two for 0.100 µm filtered samples) were collected in association with this sampling event. The results of this evaluation are discussed in Section 2.4.

2.1 Data Validation Summary

The total number of results for the evaluation reported for the SMTSIU is 567 {378 results (0.45 µm filtered and unfiltered) and 189 results (0.100 µm filtered)}. The total number of results is calculated by summing the number of analytes reported for all samples analyzed. The section below discusses the data validation summary for the surface water samples.

2.1.1 Surface Water Samples (0.45 µm filtered and unfiltered)

Based on the results of data validation, 24% of the results were qualified as estimated, 16% of the results were qualified as nondetect, and 2.9% of the results were qualified as unusable. There were a total of 378 results for the surface water sample collected for this sampling event.

Sixty of the results were qualified as nondetect due to method blank, calibration blank, field blank, and/or rinsate blank contamination. These results comprise 16% of the data set.

Approximately 24% of the results (91 of 378) were qualified as estimated for various reasons. The breakdown of the reasons for qualification as estimated is as follows:

- Sixty of the results were qualified as estimated because the results were reported between the MDL and RL. These results comprise approximately 16% of the data set.
- Twenty three of the results were qualified as estimated due to high or low matrix spike recoveries. These results comprise approximately 6.1% of the data set.
- Eight of the results were qualified as estimated on the basis of field or method duplicate results. These results comprise approximately 2.1% of the data set.
- None of the results were qualified as estimated on the basis of the method blank and/or calibration blank.

With the exception of eleven sulfate results, all analytical data generated were considered usable for reconciliation with project objectives as these data were considered to be valid (valid data include results qualified as estimated or nondetect).

2.1.2 Surface Water Samples (0.100 µm filtered)

Based on the results of data validation, 9% of the results for 0.100 µm filtered samples were qualified as estimated, 5.3% of the results were qualified as nondetect, and none of the

results were qualified as unusable. There were a total of 189 results for the surface water samples (0.100 µm) collected for this sampling event.

Ten of the results were qualified as nondetect due to field blank and/or calibration blank contamination. These results comprise 5.3% of the data set.

None of the results were qualified as unusable.

Approximately 9% of the results (17 of 189) were qualified as estimated because the results were reported between the MDL and RL.

All analytical data generated were considered usable for reconciliation with project objectives as these data were considered to be valid (valid data include results qualified as estimated or nondetect).

2.2 Reporting Limits and Decision Criteria Comparison

In order to determine whether the data are sufficient for comparing to the decision criteria, the reporting limits obtained need to be reconciled with the decision criteria. Table 2-1 lists the reporting limit requirements and decision criteria for the surface water samples.

2.2.1 Surface Water Samples (0.45 µm filtered and unfiltered)

Sixty of the sample results for the surface water samples (0.45 µm filtered) were qualified as nondetect on the basis of various combinations of method blank, field blank, rinsate blank, and/or continuing calibration blank contamination. For these results, either the reported values then become the “effective” reporting limits if the result is greater than the reporting limit or the reporting limit is the “effective” reporting limit if the reported concentration is less than the reporting limit.

The sodium “adjusted” reporting limits ranged from 3.5 mg/l to 16.2 mg/l. There is no screening criterion for sodium. The alkalinity “adjusted” reporting limit was 20 mg/l. There is no screening criterion for alkalinity. The “adjusted” reporting limits for dissolved aluminum (0.007 mg/l), total iron (0.05 mg/l), dissolved copper (0.003 mg/l), total copper (0.0052 mg/l), dissolved lead (0.0005 mg/l), total lead (0.0007 mg/l), chloride (5 mg/l) , and nitrate/nitrite as N (0.1 mg/l), were all below or equal to the screening levels. Therefore, the elevated RLs do not affect the usability of the data for these samples.

2.2.2 Surface Water Samples (0.100 µm filtered)

Ten of the sample results for the surface water samples (0.100 µm filtered) were qualified as nondetect on the basis of various combinations of field blank and/or continuing

calibration blank contamination. For these results, either the reported values then become the "effective" reporting limits if the result is greater than the reporting limit or the reporting limit is the "effective" reporting limit if the reported concentration is less than the reporting limit.

The "adjusted" reporting limits for dissolved copper (0.003 mg/l) and dissolved manganese (0.003 mg/l), were all below or equal to the screening levels. Therefore, these elevated RLs do not affect the usability of the data for these samples.

The dissolved cadmium "adjusted" reporting limit for sample CDW-1-U was 0.009 mg/l, above the screening criterion of 0.005 mg/l. Therefore, this result is not usable for comparing to the decision criterion.

2.3 Effect of Potential Biases and Imprecision on Usability of the Data

Any potential biases and imprecision in results suggested by QC results must be assessed in order to evaluate the ultimate usability of the data for making decisions. Potential biases and imprecision in analytical results are inferred from results obtained for various types of quality control sample analyses. Potential bias and imprecision can result from specific sample matrix analyzed or the analytical system.

Quality control analyses that provide an indication of the analytical system relative to the specific sample matrix include matrix spike analyses, post-digestion spike analyses, laboratory duplicate analyses, and field duplicate analyses. Matrix spike samples are site-specific samples into which target analytes are spiked. As such, the percent recoveries obtained from matrix spike analyses provide an indication of the potential biases of the analytical method on the site-specific sample results. Additionally, laboratory duplicate analyses provide an indication of the precision of the analyses. A matrix spike and/or duplicate sample analysis (as applicable to the methodology) was conducted for each analysis type using a site-specific sample.

Results obtained for other QC parameters, such as contract required detection limit (CRDL) standard recoveries and laboratory control sample recoveries (LCS), provide indications of biases existing in the analytical system. A CRDL standard is required by ILMO4.0, but is not required by Methods 200.7 nor run by the laboratory. In addition, there are no acceptance criteria given in the 1994 Functional Guidelines for Data Validation. Since this standard is just being used to collect performance information in the CLP program using ILMO4.0, there is no effect on the quality of the data caused by this absence.

While the results obtained for the vast majority of quality control analyses satisfied the QAP acceptance limits indicating that overall, acceptable levels of accuracy and precision were attained, results for a few quality control results were outside the QAP prescribed acceptance limits. Quality control results that suggest a potential bias in the analytical result are discussed below along with their effect on the usability of the associated data.

2.3.1 Surface Water Samples (0.45 µm filtered and unfiltered)

Total Iron Imprecision – The RPD between the parent sample and field duplicate results exceeded the evaluation criterion of ≤50% with a RPD of 187%. Based on the duplicate results, the maximum imprecision may be up to ±187%.

The total iron results for the samples ranged from ND (0.05mg/l) to 17.30 mg/l. The total iron MCL is 0.3 mg/l. The 0.05 mg/l reporting limit is within the range of uncertainty below the MCL represented by 187% RPD (0.01 to 0.3 mg/l). Sample concentrations above 0.01 mg/l and below 0.3 mg/l are not usable for demonstrating the concentration is less than the criterion. Therefore the nondetect results (0.05 mg/l) for samples CDW-1, SW08, SW07, and SW10 and the result for sample SW06A (0.06 mg/l) are not considered usable for demonstrating that the concentrations are less than 0.30 mg/l. All other sulfate results were reported at concentrations greater than the MCL.

Dissolved Magnesium Imprecision – The difference between the parent sample and field duplicate dissolved magnesium results was 3.4 mg/l with both results within 5x the RL of the RL, suggesting an imprecision of ±3.4 mg/l at concentrations near the RL. The dissolved magnesium results ranged from 0.017 mg/l and 46.7 mg/l. There is no dissolved magnesium screening criteria. Therefore, the potential bias does not affect the usability of the results for making the specified decision.

Total Aluminum Imprecision – The difference between the parent sample and field duplicate total aluminum results was 21.58 mg/l with both results within 5x the RL of the RL, suggesting an imprecision of ±21.58 mg/l at concentrations near the RL. The total aluminum results ranged from 0.013 mg/l and 21.80 mg/l. The total aluminum EPA Secondary MCL is 0.05 mg/l. Therefore, all sample concentrations are not considered usable for demonstrating the concentrations are less than the criterion.

Sulfate Accuracy – The recovery for the matrix spike sample was 0%, suggesting a maximum potential low bias of 100% for the detected results. The nondetect results were qualified as unusable. The detected sulfate results ranged from 13 mg/l to 380 mg/l.

The sulfate EPA MCL is 250 mg/l. Therefore, sample concentrations between about 0 mg/l and 250 mg/l are considered not to be usable for demonstrating the concentration is less than the criterion. Six results were reported between these concentrations. Therefore, all sample concentrations are not considered usable for demonstrating the concentrations are less than the criterion.

The sulfate result for sample SW05 was reported at a concentration of 380 mg/l, which exceeds the EPA MCL.

Total Phosphorus Accuracy and Imprecision – The recovery for the matrix spike sample was 131.8%, suggesting a maximum potential high bias of 31.8% for the detected results. The difference between the parent sample and field duplicate total phosphorus results was 0.55 mg/l with both results within 5x the RL of the RL, suggesting an imprecision of ±0.55 mg/l at concentrations near the RL. The total phosphorus results ranged from 0.01 mg/l to 0.62 mg/l. There is no total phosphorus screening criteria. Therefore, the potential bias does not affect the usability of the results for making the specified decision.

2.4 Representativeness Evaluation

Representativeness is the degree to which data accurately and precisely represent a characteristic population, parameter variations at a sampling point, or an environmental condition. All sampling and analysis was conducted in compliance with the FSP and relevant standard operating procedures (SOPs) as a means of obtaining representative samples.

Additionally, the results obtained for field duplicate results can be used to assess representativeness. Four field duplicate pairs (two for the 0.45 µm filtered and unfiltered and two for 0.100 µm filtered samples) were collected in association with this sampling event. The results for the field duplicate samples were compared using the applicable concentration-dependent evaluation criteria. With four exceptions, all analytes satisfied the applicable concentration-dependent criteria indicating that the samples collected can be considered representative of the medium sampled at the locations.

TABLE 2-1

REPORTING LIMIT REQUIREMENTS AND DECISION CRITERIA

Analyte	MDL (mg/l)	RL (mg/l)	MCL (mg/l)
Dissolved Aluminum	0.001	0.005	0.05 to 0.2[3]
Total Aluminum	0.005	0.03	0.05 to 0.2[3]
Total Cadmium	0.0001	0.0005	0.005
Dissolved Cadmium	0.0001	0.0005	0.005
Dissolved Calcium	0.2	1	---
Dissolved Copper	0.0005	0.003	1.3[1]
Total Copper	0.0005	0.003	1.3[1]
Dissolved Iron	0.02	0.05	0.3[3]
Total Iron	0.02	0.05	0.3[3]
Dissolved Lead	0.0001	0.0005	0.015[1]
Total Lead	0.0001	0.0005	0.015[1]
Dissolved Magnesium	0.2	1	---
Dissolved Manganese	0.0005	0.003	0.05[3]
Total Manganese	0.0005	0.003	0.05[3]
Dissolved Potassium	0.3	2	---
Dissolved Sodium	0.3	2	---
Alkalinities	2	20	---
DOC	1	5	---
TOC	1	5	---
Chloride	1	5	250[3]
Nitrate/ Nitrite as N	0.02	0.1	1[2]
Total Phosphorus	0.01	0.05	---
Sulfate	1	5	250[3]

MDL- Method Detection Limit RL – Reporting limit MCL – Maximum Contaminant Level
mg/L – Milligrams per Liter

[1] Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of the tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

[2] The MCL value is for Nitrite as N.

[3] MCL values were derived from National Standard Drinking water Regulations – Secondary Standards.

Note: MCLs are based on total fractions.

3. POTENTIAL ADDITIONAL DATA USES AND LIMITATIONS

In addition to use in making decisions specified in the FSP, the data generated may potentially have other end uses including risk assessment and exploratory data analysis. The analytical data quality is generally considered sufficient for these potential end uses, however, the magnitude of potential biases and imprecisions discussed above must be considered. Prior to use in risk assessment or exploratory data analysis, end users of the data should perform a data quality assessment relative to their specific risk assessment objectives and should perform an evaluation of whether the analytical data are sufficiently representative of the medium under evaluation.

All analytical results not qualified as rejected are considered useable in these additional potential end uses. All data were validated in accordance with the provisions of the Administrative Order on Consent approved Quality Assurance Plan (March, 1997) using guidance from the USEPA National Functional Guidelines for Inorganic Data Review (February 1994). The data validation meets the minimum requirements specified in USEPA's Risk Assessment Guidance for Superfund (September, 1989) (RAGS) and those specified in USEPA's Guidance for Data Usability in Risk Assessment (April, 1992) (DURA). Data qualified as estimated were assigned a "J" qualifier and data rejected during validation were assigned an "R" qualifier and are not useable for any end use. All data which were qualified as estimated were assigned a qualifier code indicating the reason for qualification and a suffix to the qualifier code indicating the potential bias direction based on the QC indicators. The qualifier codes have been annotated on the analytical result reporting forms and also entered into the project database management system. A code suffix of "L" for a given result indicates a potential low bias exists, "H" a potential high bias, and "I" indicates imprecision in the result without a bias direction being discernible from the QC indicators.

As specified in DURA, data qualified as "U" (nondetect) or "J" (estimated) are acceptable for risk assessment purposes. DURA (page 5-15) further indicates that:

"the guidance here is to use J-qualified concentrations the same way as positive data that do not have this qualifier. If possible, note potential uncertainties associated with the qualifier, so that if data qualified with a J contribute significantly to the risk, then appropriate caveats can be attached."

Section 2.3 above provides a detailed description of the magnitude and direction of potential biases associated with J-qualified data and should be useful to the risk assessor in evaluating the uncertainty associated with qualified results.

Each end user of the data should perform a data quality assessment relative to their specific end use objectives for the data and should perform an evaluation of whether the analytical data are sufficiently representative of the medium under evaluation for their specific data use. The discussion on reporting limits, bias, and representativeness should be useful in performing a data quality assessment relative to other end uses of the data and in evaluating whether the data are sufficiently representative of the medium under evaluation for a specified end use.

4. SUMMARY OF DATA QUALITY ASSURANCE OBJECTIVES RELATIVE TO THE QAP OBJECTIVES

In this section, the results of the data validation process are briefly summarized relative to each of the data quality assurance objectives. The Data Validation Report for SmTSIU for Surface Water Samples (URS, May - 2008) provides additional detailed narratives describing each QC problem and the data qualification assigned if necessary. The overall data quality was assessed by the quantitative parameters of reporting limits, accuracy, precision, and completeness and the qualitative parameters of representativeness and comparability. Sections 4.1 and 4.2, respectively, present the overall assessment of the data quality with regard to the quantitative and qualitative evaluation parameters.

4.1 Quantitative Parameters

The overall assessment for each of the quantitative data quality assurance parameters (of reporting limits, accuracy, precision, and completeness) is provided below. The summaries are based on the results obtained during the data validation process.

4.1.1 Reporting Limits

Reporting limits (RLs) are established by the analytical laboratory based on the instrument detection limits (IDLs), historical data, and comparison to EPA limits for the respective methods. As discussed in Section 2.2 and summarized below, several reporting limits exceeded the reporting limit requirements.

Surface Water Samples (0.45 µm filtered and unfiltered)

Sixty of the sample results for the surface water samples (0.45 µm filtered) were qualified as nondetect on the basis of various combinations of method blank, field blank, rinsate blank, and/or continuing calibration blank contamination. For these results, either the reported values then become the “effective” reporting limits if the result is greater than the reporting limit or the reporting limit is the “effective” reporting limit if the reported concentration is less than the reporting limit.

The sodium “adjusted” reporting limits ranged from 3.5 mg/l to 16.2 mg/l. There is no screening criterion for sodium. The alkalinity “adjusted” reporting limit was 20 mg/l. There is no screening criterion for alkalinity. The “adjusted” reporting limits for dissolved aluminum (0.007 mg/l), total iron (0.05 mg/l), dissolved copper (0.003 mg/l), total copper (0.0052 mg/l), dissolved lead (0.0005 mg/l), total lead (0.0007 mg/l), chloride (5 mg/l) , and

nitrate/nitrite as N (0.1 mg/l), were all below or equal to the screening levels. Therefore, the elevated RLs do not affect the usability of the data for these samples.

Surface Water Samples (0.100 µm filtered)

Ten of the sample results for the surface water samples (0.100 µm filtered) were qualified as nondetect on the basis of various combinations of field blank and/or continuing calibration blank contamination. For these results, either the reported values then become the "effective" reporting limits if the result is greater than the reporting limit of the reporting limit is the "effective" reporting limits if the reported concentration is less than the reporting limit.

The "adjusted" reporting limits for dissolved copper (0.003 mg/l) and dissolved manganese (0.003 mg/l), were all below or equal to the screening levels. Therefore, the elevated RLs do not affect the usability of the data for these samples.

The dissolved cadmium "adjusted" reporting limit for sample CDW-1-U was 0.009 mg/l, above the screening criterion of 0.005 mg/l. Therefore, these data are not usable for comparing to the decision criterion.

4.1.2 Precision

Precision is defined as the agreement between a set of replicate measurements without assumption or knowledge of the true value. Precision of laboratory measurements was evaluated by the comparison of matrix spike sample/matrix spike sample duplicate results.

All of the laboratory duplicate results satisfied the applicable evaluation criteria. Therefore, the overall level of precision demonstrated by the analyses is considered to be acceptable.

Precision of field sampling and laboratory analysis was evaluated by the comparison of field duplicate sample results. With four exceptions, all of the field duplicate results satisfied the applicable evaluation criteria. The agreement shown by the field duplicate results is indicative of an acceptable level of overall sampling and analysis precision.

4.1.3 Accuracy

Accuracy is defined as the degree of agreement of a measurement to an accepted reference or true value. Accuracy was measured as the percent recovery (%R) of an analyte in a reference standard or spiked sample.

All laboratory control samples and all calibration standards and were within acceptance limits demonstrating acceptable overall accuracy of the analytical system.

With the exceptions of the high total phosphorus MS recovery for sample SW04 and the low sulfate recovery for sample SW07, all matrix spike recoveries were within the acceptance limits.

4.1.4 Completeness

Two types of completeness were calculated, program completeness and analytical completeness. Sections 4.1.4.1 and 4.1.4.2 provide respective definitions and a summary of the results.

4.1.4.1 Program Completeness

The program completeness is considered to be 100% (number of samples and field QC samples collected compared to the planned sampling stations and the quantity of field QC samples) which met QAP requirements.

4.1.4.2 Analytical Completeness

With the exception of the nondetect sulfate results, all of the results are considered usable as qualified. As such, the analytical completeness for the supplemental sampling, defined as the ratio of the number of valid analytical results (valid analytical results include estimated values) to the total number of analytical results requested on samples submitted for analysis, is greater than 98% which satisfies the QAP requirement of 80%. All valid results are considered acceptable for use in meeting project objectives.

4.2 Qualitative Parameters

The qualitative data quality assessment parameters include comparability and representativeness. Sections 4.2.1 and 4.2.2 provide the respective definitions and summary of the results for each parameter.

4.2.1 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data are comparable if collection techniques, measurement procedures, method, and reporting limits are equivalent for the samples within a sample set. As the samples in this set were analyzed in accordance with Method 200.7 and 200.8 and quality control measures described in the methods, and acceptable levels of overall accuracy

and precision were attained, the data within this set are considered to be comparable to each other.

4.2.2 Representativeness

Representativeness is the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness was maintained during sampling efforts by completing sampling in compliance with the FSP, and relevant SOPs.

Consistent, uniform sample collection protocols, including such tasks as storage, preservation and transportation, were used to assure that the representativeness of the samples gathered during the AOC met project objectives. Proper documentation in the field and laboratory verified that protocols were followed and that sample identification as well as integrity was preserved.

5. CORRECTIVE ACTIONS AND WORKPLAN MODIFICATIONS

This section describes the corrective actions implemented and workplan modifications that occurred during the supplemental sampling and analysis and the effect on the usability of the data.

5.1 Corrective Action

No field or laboratory corrective actions were required during this investigation.

5.2 QAP and FSP Modifications

There was one modification to the QAP. Method 200.7 was run and followed by the laboratory for the metals analyses instead of ILMO4.0. As documented in the DVR, evaluation of the data indicated this change is not considered to significantly affect the usability of the data.

The following modification was made to the FSP: A 5 gallon cubitainer was used to composite the sample prior to filling the samples containers for the two different laboratories.

6. REJECTED DATA AND PROJECT CONSEQUENCES

With the exception of the nondetect sulfate results, all results will be considered acceptable for use in meeting project objectives.

7. CONCLUSIONS

With the exceptions of any limitations noted in Section 2.0 and the nondetect sulfate results, the data are considered to be usable for meeting project objectives. As described in Section 3.0, these data are also considered to be of sufficient analytical quality for a variety of other end uses. For end uses of the data other than those for which are specified in Section 2.0, the end user of the data should perform a data quality assessment relative to their specific end use objectives and should perform an evaluation of whether the analytical data are sufficiently representative of the medium under evaluation for their specific data use.

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Appendix A Data Reporting Forms

1. INTRODUCTION

This report contains the results of the data validation conducted for the surface water samples collected for the Smelter Tailings Soil Investigation Unit (SmTSIU). The data were reviewed in accordance with the approved Quality Assurance Plan (QAP) prepared by Chino Mines Company and Steffen, Robertson and Kirsten (U.S.), Inc. (March 1997).

The samples were collected in September 2007 through December 2007. The samples were sent to ACZ Laboratories, Inc. in Steamboat, Colorado for analysis. Samples with the suffix "U" at the end of the client ID were ultra filtered using a 0.001 um filter. The samples were analyzed for the following parameters: dissolved metals and hardness as $CaCO_3$. The other filtered samples were filtered using a 0.45 um filter. Samples other than those filtered through a 0.001 um filter were analyzed for the following parameters: total phosphorus, total and dissolved metals, alkalinities, dissolved organic carbon, total organic carbon, chloride, hardness as CaCO3, nitrate/nitrite as N, and sulfate. Results of the data validation performed on samples reported in these packages are presented in Sections 4 and 5.1 through 5.9 of this report.

Table 1-1 lists the samples for which data were validated, the corresponding data package, and the review narrative section in which validation results are presented. The cross reference to the laboratory identification numbers can be found in each of the review sections.

TABLE 1-1
DATA PACKAGE AND SAMPLE IDENTIFICATION SUMMARY

Data Package	Report Section[1]	Field Sample Identification*
L65006	5.1	SW01
		SW02
		SW03
		SW05
		SW06A
L65029	5.2	CDW-1
		SW12
		SW312
		SW11
		SW13
		SW14
L65087	5.3	SW08
		SW07
		TB-1
		SW09
		SW10
L65088	Section 4, 5.4	BDLU-4
		SW313
		SW15
		SW04
		ER-1
L66007	5.5	SW-06-U
		SW-02-U
		SW-08-U
		SW-12-U
		SW-01-U
L66467	5.6	SW-04-U
		SW-05-U
		SW-09-U
		SW-10-U
L66778	5.7	SW-312-U
		TB-1-U
		SW11-U
		SW14-U
		SW-15-U
L67069	5.8	SW-07-U
		SW-313-U
		SW-13-U
		BDW-4-U

TABLE 1-1
DATA PACKAGE AND SAMPLE IDENTIFICATION SUMMARY

Data Package	Report Section[1]	Field Sample Identification*
		SW06-D
L67712	5.9	CDW-1-U
		ER-1-U

1 Data package L65088 was used to evaluate both laboratory performance criteria (Section 4) and sample specific criteria (Section 5).

This data validation report describes the data validation process used and presents the data review results for water samples and associated quality control (QC) sample analyses.

In accordance with the QAP, a review of all data was conducted independently of the laboratory. The review consisted of evaluation of laboratory performance criteria and sample-specific criteria using guidance from the USEPA National Functional Guidelines for Inorganic Data Review (February 1994). The laboratory performance criteria evaluated included: initial calibration procedures and results, continuing calibration procedures and results, inductively coupled plasma (ICP) interference check sample results, contract required detection limit (CRDL) standard analysis and results, laboratory control sample results, and result quantitation and verification. An evaluation of laboratory performance criteria was conducted on at least 10% of the data set per analysis type. Section 2 and Tables 2-1 and 2-2 provide the QC requirements for the laboratory performance criteria.

The sample-specific criteria evaluated included: COC and sample receipt documentation, holding times, blank contamination, duplicate sample analysis, matrix spike/matrix spike duplicate sample analysis, serial dilution results (as applicable to the method), post digestion spike recovery (as applicable to the method), and field duplicate results agreement as applicable to the method. The sample specific criteria were evaluated for every data package received. Section 3 and Table 3-1 summarize the sample-specific criteria that were used in the data validation process and how data were qualified.

Section 4 presents the results of the evaluation of laboratory performance criteria. The review of sample-specific criteria is presented in Section 5. The results obtained for field quality control samples are discussed in Section 6 and an overall assessment of data, with respect to the data quality indicators, is presented in Section 7.

During the data validation process, the data reviewer annotated on the analytical data sheets any data validation qualifiers assigned (“U”, “J”, “UJ”, and “R”) and associated qualifier and bias codes as listed in Tables 1-2 and 1-3. The purpose of the qualifier codes is to provide information with regard to the data quality condition(s) that resulted in the assigned qualifiers. The bias code provides an indication of the bias direction of the results qualified as estimated based on data quality condition(s) that resulted in the data qualification and the results of the other associated quality control analyses. The data qualifier codes are followed by a hyphen and the applicable bias code. For example, a result qualified as estimated due to a holding time exceedance, which resulted in a potential low bias in the result, has the following code annotated on the data sheet, “HT-L.” In the case of multiple data quality conditions resulting in qualification, each qualifier code is listed and separated by a comma. For example, a result qualified as estimated due to low matrix spike recovery and poor method duplicate precision would have the following codes annotated on the data sheet, “MS, D – I. The data reporting forms with assigned data qualifiers are included in Appendix A.

TABLE 1-2
DATA VALIDATION QUALIFIER DEFINITIONS

Qualifier	Definitions [1]
U	The analyte was analyzed for, but was not detected above the level of the associated value. The associate value is either the sample quantitation limit or the sample detection limit.
J	The associated value is an estimated quantity.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. (Note: Analyte may or may not be present.)

[1] USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994.

TABLE 1-3
DATA VALIDATION QUALIFIER CODES

Qualifier Code	Data Quality Condition Resulting In Assigned Qualification
General use	
HT	Holding time requirement was not met
MB or PB	Method blank or preparation blank contamination
LCS	Laboratory control sample evaluation criteria not met
RB	Rinsate blank contamination
FD	Field duplicate evaluation criteria not met
P	Preservation requirement was not met
EF	Extraction fluid contamination
RL	Reporting limit exceeds decision criteria (for nondetects)
Inorganic methods	
ICV	Initial calibration verification evaluation criteria not met
CCV	Continuing calibration verification evaluation criteria not met
CCB	Continuing calibration blank contamination
PB	Preparation blank contamination
ICS	Interference check sample evaluation criteria not met
LD	Laboratory duplicate precision evaluation criteria not met
MS and/or MSD	Matrix spike and/or matrix spike duplicate recovery outside acceptance range
PDS	Post-digestion spike recovery outside acceptance range
MSA	Method of standard additions correlation coefficient ≤ 0.995
D	Duplicate precision evaluation criteria not met
IS	Internal standard recovery outside acceptance range for ICP-MS
ICS	Interferent check solution evaluation criteria not met
SD	Serial dilution results did not meet evaluation criteria
CRDL	Contract Required Detection Limit standard recovery not met
CE	Counting error
Bias Codes	**Bias Direction**
H	Bias in sample result likely to be high
L	Bias in sample result likely to be low
I	Bias in sample result is indeterminate

2. EVALUATION OF LABORATORY PERFORMANCE CRITERIA

The laboratory performance review criteria used in validation are summarized in Tables 2-1 and 2-2. Table 2-1 is pertinent to metals determination by ICP and ICP-MS. Table 2-2 is pertinent to mercury, and general chemistry parameters. Laboratory performance criteria were evaluated for one of the packages for each analysis parameter group. The results of the laboratory performance criteria review are presented in Section 4.

TABLE 2-1
LABORATORY PERFORMANCE CRITERIA – METALS (ICP-200.7 AND ICPMS – 200.8)

Method	QC Check	Minimum Frequency	Acceptance Criteria	Qualifiers
ICP/ICP-MS	Initial calibration (minimum 1 standard and a blank)	Daily prior to sample analysis	• Correlation Coefficient ≥0.995 for linear regression.	• If r <0.995, qualify all results as estimated (J/UJ).
	Second source initial calibration verification (ICV)	Daily after initial calibration	• All analytes within ±10% of expected value. • RSD of replicate integrations <5%.	• If %R falls outside the acceptance range but within range of 75-89% or 111-125%, qualify results >IDL as estimated (J). • If %R is within 111-125%, results <IDL are acceptable. • If %R is 75-89%, qualify results <IDL as estimated (UJ). • If %R is <75%, qualify all results as unusable (R). • If %R is >125%, qualify results >IDL as unusable (R); results <IDL are acceptable without qualification. • No qualification issued for RSD >5%.
	Continuing calibration verification (CCV)	After every 10 samples and at the end of the analysis sequence	• All analytes within ±10% of expected value. • RSD of replicate integrations <5%.	
	Linear Range Analysis (LRA)	Quarterly	• All analytes agree within 5% of true value.	• NA
	Contract Required Detection Limit (CRDL) standard	At beginning and end of each sample analysis	• None	• Professional judgment will be used for the need for qualification for %Rs outside 50-150% based on the relative concentration of the CRDL standard and the sample concentration.
	Interference check solution (ICS)	At the beginning and end of the analytical run	• Recovery of spiked analytes within ±20% of expected value. • Results for analytes not present in the ICS solution must be <RL.	• If %R is >120%, results <IDL are acceptable. • If %R is >120%, qualify results >IDL as estimated (J). • If %R is within 50-79%, qualify results >IDL as estimated (J). • If %R is within 50-79%, qualify results <IDL as estimated (UJ). • If %R is <50%, qualify all results as unusable (R). • If results > IDL are observed that are not present in the ICS solution and the sample has concentrations at the level of the interferents concentrations, qualify sample results >IDL as estimated (J) if the amount of bias is ≥25% of sample result. • If negative concentrations are observed that are not present in the ICS solution at a concentration where the absolute value is >IDL, qualify sample results as estimated (J/UJ) if the bias is more than 25% of the reported result and the sample has a concentration comparable to the interferent concentrations in the ICS solution.
	Laboratory Control Sample (LCS) (aqueous)	One per analytical batch containing aqueous samples	• 80-120% recovery for water samples.	• If %R is within 50-79% or >120%, qualify results >IDL as estimated (J). • If %R >120%, results <IDL are acceptable without qualification. • If %R is within 50-79%, qualify results <IDL as estimated (J/UJ) • If %R is <50%, qualify all results as unusable (R).
	Laboratory Control Sample (LCS) (solid)	One per analytical batch containing solid samples	• LCS results must fall within the control limits established by the EPA.	• If LCS recovery falls outside the control limits, qualify results >IDL as estimated (J). • If LCS recovery is > control limits, results <IDL are acceptable without qualification. • If LCS recovery is>50 % and < control limits, qualify results <IDL as estimated (J/UJ). • If %R is <50%, qualify all results as unusable (R).

TABLE 2-2
LABORATORY PERFORMANCE CRITERIA – MERCURY, TOM, AND GENERAL CHEMISTRY PARAMETERS

Method*	QC Check	Minimum Frequency	Acceptance Criteria	Qualifiers
Mercury General Chemistry Parameters	Initial multipoint calibration (minimum 3 standards and a blank)	Daily prior to sample analysis	• Correlation Coefficient ≥0.995 for linear regression.	• If r <0.995, qualify all results as estimated (J/UJ).
	CRDL standard	At beginning and end of each sample analysis	None	• Professional judgment will be used for the need for qualification for %Rs outside 50-150% based on the relative concentration of the CRDL standard and the sample concentration.
	Second source initial calibration verification (ICV)	Daily after initial calibration	• Analyte within ± 20% of expected value.	• If %R falls outside the acceptance range but within range of 65-79% or 121-135%, qualify results >IDL as estimated (J). • If %R is within 121-135%, results <IDL are acceptable without qualification. • If %R is 65-79%, qualify results <IDL as estimated (UJ). • If %R is <65%, qualify all results as unusable (R). • If %R is >135%, qualify results >IDL as unusable (R); results <IDL are acceptable.
	Continuing calibration verification (CCV)	After every 10 samples and at the end of the analysis sequence	• Analyte within 20% of expected value.	• If %R falls outside the acceptance range but within range of 65-79% or 121-135%, qualify results >IDL as estimated (J). • If %R is within 121-135%, results <IDL are acceptable without qualification. • If %R is 65-79%, qualify results <IDL as estimated (UJ). • If %R is <65%, qualify all results as unusable (R). • If %R is >135%, qualify results >IDL as unusable (R); results <IDL are acceptable.
	Laboratory Control Sample (LCS) (aqueous)	One per analytical batch containing aqueous samples	• 80-120% recovery for water samples.	• If %R is within 50-79% or >120%, qualify results >IDL as estimated (J). • If %R >120%, results <IDL are acceptable without qualification. • If %R is within 50-79%, qualify results <IDL as estimated (J/UJ) • If %R is <50%, qualify all results as unusable (R).
	Laboratory Control Sample (LCS) (solid)	One per analytical batch containing solid samples	• LCS results must fall within the control limits.	• If LCS recovery falls outside the control limits, qualify results >IDL as estimated (J). • If LCS recovery is > control limits, results <IDL are acceptable without qualification. • If LCS recovery is>50 % and < control limits, qualify results <IDL as estimated (J/UJ). • If %R is <50%, qualify all results as unusable (R).

*As applicable to the method

3. EVALUATION OF SAMPLE-SPECIFIC CRITERIA

Sample-specific criteria were reviewed for all data packages. The review criteria and resultant actions are summarized in Table 3-1. The results of the sample-specific review are detailed in Section 5. Each subsection of Section 5 presents the review narrative for one data package.

TABLE 3-1
SAMPLE-SPECIFIC CRITERIA

Method*	QC Check	Minimum Frequency	Acceptance Criteria	Qualifiers
ICP ICPMS Mercury General Chemistry Parameters	Holding Time	Each Sample	• Analysis within the holding time requirements specified in the QAPP. • No holding time was specified in the QAPP for pH. The reviewer used a holding time of 2 days for sediment samples.	• If sample was analyzed outside the holding time requirements, then the sample results were qualified as estimated (J/UJ).
	Continuing calibration blank (CCB)	After every calibration verification	• <RL for positive results. • <RL for |negative results|.	• Sample results, for an analyte detected in an associated blank at a concentration, <5x the blank concentration, qualify as nondetect (U). • Sample results for an analyte reported in an associated blank at a negative concentration < | 4x blank concentration |, qualify results as estimated (J/UJ).
	Method Blank	One per analytical batch	• No analytes detected ≥ RL.	• Sample results, for an analyte detected in the method blank at a concentration, <5x the blank concentration, qualify as nondetect (U). • Sample results for an analyte reported in the method blank at a negative concentration < | 4x blank concentration |, qualify results as estimated (J/UJ).
	ICP Serial Dilution Test	One per analytical batch	• 1:5 dilution must agree within ±10% of the original determination for analytes present at concentrations >50x MDL.	• If %D is >10%, qualify associated data as estimated (J/UJ).
	Matrix Spike (MS)	One per 20 samples	• Recovery within 75-125% for both water and soils. • If sample result is ≥4x the spike amount then the matrix spike is not an appropriate for assessing accuracy measurement.	• If % R is >125%, results <IDL are acceptable without qualification. • If %R is >125% or <75%, qualify results >IDL as estimated (J). • If % R is within 30-74%, qualify results <IDL as estimated (J/UJ). • If % R is <30%, qualify results <IDL as unusable(R).
	Laboratory Duplicate or Matrix Spike Duplicate	One per 20 samples	If both results >5x RL • RPD for water is ≤20%. • RPD for soils is ≤35%. If either sample result is <5x the RL then • Absolute difference ≤1x RL (waters). • Absolute difference ≤2x RL (soils).	• If the RPD or absolute difference falls outside the appropriate fixed control windows, qualify the results for that analyte as estimated (J/UJ).
	Field Duplicate		If both results >5x RL • RPD for soils is ≤50%. If either sample result is <5x then • Absolute difference ≤ 3x RL.	• If the RPD or absolute difference fall outside the appropriate fixed control windows, qualify the results for that analyte as estimated (J/UJ).

TABLE 3-1
SAMPLE-SPECIFIC CRITERIA

Method*	QC Check	Minimum Frequency	Acceptance Criteria	Qualifiers
	Post-digestion spike (PDS) 200.7 (ICP)	Typically, when the MS failed or at analyst discretion	• Recovery within 75-125% for both water and soils. • If sample result is ≥4x the spike amount then the PDS is not an appropriate for assessing accuracy measurement.	• No qualification was issued. • Post-digestion spikes were conducted to aid in determining whether the MS results that were out of acceptance limits were caused by the sample matrix, a bias in the analytical system, or a combination of both.
	Internal Standard Recoveries (200.8 ICPMS only)	Required for all samples	• Recoveries within 65-125%	• Qualify associated sample results as estimated (J/UJ).

*As applicable to the method.

4. REVIEW OF LABORATORY PERFORMANCE EVALUATION CRITERIA

Data package L65088 for metal and general chemistry parameters (carbonate alkalinity as $CaCO_3$, bicarbonate alkalinity as $CaCO_3$, hydroxide alkalinity as $CaCO_3$, total alkalinity, DOC, TOC, chloride, hardness as $CaCO_3$, nitrate/ nitrite as N, total phosphorus, and sulfate) analyses were used to evaluate the laboratory performance. The data reported in this data package accounted for greater than 10% of the investigation water data. The evaluation of laboratory performance criteria was conducted as summarized in Tables 2-1 and 2-2.

The ICP/AES samples were analyzed using method 200.7 instead of ILMO4.0 as required by the QAP. Any deviations from ILMO4.0, as well as the effect on data quality, are discussed below and in Section 5. As method 200.8 is not included in ILMO4.0, the quality control checks will be required by those in method 200.8.

4.1 Initial Calibration

ICP – Each ICP analytical run was initiated with the analysis of a blank and at least one standard, which satisfied the initial calibration criterion. All metals in the second source ICV standard were recovered within the acceptance range of 90-110% for all ICV analyses. Target analytes were not detected in the initial calibration blank sample. Site-specific samples were not analyzed directly after the initial calibration blank and before the first calibration blank. Therefore, data qualification for ICP metals data was not necessary based on the initial calibration.

ICPMS – Each ICPMS analytical run was initiated with a blank and four standards. The calibrations were verified with the analysis of an ICV. All target metals were recovered within the acceptance range of 90-110%. Target analytes were not detected in the initial calibration blank sample. Site - specific samples were not analyzed directly after the initial calibration blank and before the first calibration blank. Because all response criteria were met, data qualification on the basis of initial calibration was not necessary.

General Chemistry Parameters

- For alkalinity as $CaCO_3$, the pH titration was verified using five standards.

- For DOC/TOC, the relationship between instrument response and concentration was established with a blank and four standards.

- For nitrate/ nitrite as N, the relationship between instrument response and concentration was established with a blank and six standards. The correlation coefficient was >0.995 for nitrate/ nitrite as N.

- For chloride, the relationship between instrument response and concentration was established with a blank and 5 standards. The COD was >0.990.

- For sulfate, the relationship between instrument response and concentration was established with a blank and seven standards. The COD was >0.990.

- For total phosphorus, the relationship between instrument response and concentration was established with a blank and 5 standards. The correlation coefficient was 0.995 for total phosphorus.

The calibrations were verified with the analysis of an ICV. All general chemistry parameters were recovered within the acceptance range of 80-120%. Because all response and linearity criteria were met, data qualification on the basis of initial calibration was not necessary.

4.2 Continuing Calibration Verification

The continuing calibration verification solutions (CCV) were analyzed at the required frequency for all methods. All continuing calibration criteria were satisfied and data qualification was not necessary.

4.3 Interference Check Sample (ICS) for Metals

Method 200.7 requires that the SIC (Spectral Interference Check Solution), which is equivalent to the ICSA, required by ILMO4.0, be periodically checked for metals analyses. No results for samples reported in this package were at concentrations approaching the interfering elements concentrations specified in ILMO4.0 for the ICSA solution. Method 200.8, which is not included in ILMO4.0, doesn't require that an ICSA be analyzed.

4.4 Laboratory Control Samples (LCS)

Laboratory control samples were prepared with each batch of samples. The recoveries for all analytes were within the control limits of 80-120%. Therefore, data qualification based on LCS results was not necessary.

4.5 CRDL Standard (Metals Only)

A CRDL standard (a low standard with concentrations at the laboratory reporting limit) is required by ILMO4.0, but is not required by methods 200.7 and 200.8 nor run by the laboratory. In addition, there are no acceptance criteria given in the 1994 Functional Guidelines for Data Validation. Since this standard is just being used to collect performance information in the CLP program using ILMO4.0, there is no effect on the quality of the data caused by this absence.

4.6 Tune (ICPMS)

The tuning solution was analyzed at the beginning of every 12 hours of sample analysis. The relative standard deviations were all < 5% for all analytes contained in the tuning solution and the resolution and mass calibration of the instrument were also within the required acceptance ranges. Data qualification on the basis of instrument tuning was not necessary.

4.7 Sample Quantitation and Result Verification

Sample quantitation was checked by recalculating a minimum of 10% of the reported sample results from the raw system printouts. Examples of calculated results included correlation coefficients, reported sample results, percent differences for serial dilutions, recoveries for calibration standards, and RPDs between duplicate results. No calculation or reporting errors were found.

5. REVIEW OF SAMPLE SPECIFIC CRITERIA FOR ALL DATA PACKAGES

Sample-specific criteria were evaluated for all data packages. The evaluation of sample-specific criteria was conducted as summarized in Table 3-1. The data review narratives for the nine data packages are presented in Subsections 5.1 through 5.9.

5.1 ACZ Data Package L65006

Data package L65006 contained the analytical results for five surface water samples. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L65006-01	SW01	MD – Alkalinity as CaCO3, Chloride, Sulfate MS - DOC MS/MSD – Dissolved Potassium
L65006-02	SW02	MD – DOC
L65006-03	SW03	
L65006-04	SW05	
L65006-05	SW06A	MS - TOC

ID – Identification MD – Method Duplicate PDS – Post Digestion Spike
DOC – Dissolved Oxygen Content TOC – Total Organic Carbon

5.1.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.1.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 5.5°C upon receipt, within the ≤6°C temperature criterion.

5.1.3 Holding Times

All analyses were conducted within holding time limits. Therefore, data qualification was not considered necessary.

5.1.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Two target analytes were detected in the preparation blanks. The table below lists the target analytes detected in the preparation blanks and any qualification issued.

Work Group /Analyte	PB (mg/L)	Data Qualification
Total Metals		
WG232466		
Total Aluminum	0.0084	None. All total aluminum results were reported at concentrations >5x the preparation blank concentration. Therefore, data qualification was not necessary.
Total Selenium	0.0001	All selenium results for the samples reported in this data package were qualified as nondetect (U) at the reported concentrations.

PB – Preparation Blank mg/L – Milligrams per Liter U – Non-detect

Calibration Blanks

Several target analytes were detected in various CCBs for the metals analysis. The table below lists the analytes detected in the CCBs associated with the samples reported in this SDG and any qualification issued.

Analyte	CCB	Result (mg/L)	Data Qualification
Total Metals			
WG232466			
Total Aluminum	CCB 3	0.0073	None. Associated sample results were reported at concentrations greater than five times positive amounts found in the CCBs.
	CCB 1	0.0029	
Dissolved Metals			
WG232542			
Dissolved Aluminum	CCB 3	0.0012	None. Associated sample results were reported at concentrations greater than five times positive amounts found in the CCBs.
	CCB 2	0.0016	
Dissolved Lead	CCB 3	0.00022	Numbers of dissolved lead results for the samples reported in this data package were qualified as nondetect (U) at the reporting limit.
	CCB 2	0.00019	
Inorganics			
WG232827			
Sulfate	CCB 14	1.4	The sulfate result for sample SW01 was qualified as non-detect (U) at the reporting limit.

CCB – Continuing Calibration Blanks mg/L – Milligrams per Liter U – Non-detect

- An empty cell indicates that the analyte was not detected with an absolute value > IDL or that samples were not bracketed by this CCB.

5.1.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.1.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.1.7 Serial Dilution

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.1.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.1.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.2 ACZ Data Package L65029

Data package L65029 contained the analytical results for five surface waters samples and one field duplicate. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L65029-01	CDW-1	MS/MSD – Total Iron MS – DOC, TOC
L65029-02	SW12	MS/MSD – Total Aluminum, Total Cadmium, Total Copper, Total Lead, Total Manganese MS - Total Phosphorus

Laboratory ID	Field ID	QC Designation
L65029-03	SW312	MD – Total Phosphorus FD to sample SW12
L65029-04	SW11	MD – Alkalinity as CaCO3
L65029-05	SW13	MS/MSD – Dissolved Aluminum, Dissolved Calcium, Dissolved Copper, Dissolved Lead, Dissolved Manganese MS – Nitrate/Nitrite as N
L65029-06	SW14	MD – DOC, Chloride, Nitrate/ Nitrite as N MS – Chloride

MSD – Matrix Spike Duplicate
MS – Matrix Spike
MD – Method Duplicate
PDS – Post-Digestion Spike
DOC – Dissolved Oxygen Content
TOC – Total Organic Carbon

5.2.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.2.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 6.6°C upon receipt, exceeding the ≤6°C temperature criterion. Data qualification was not considered necessary based on the stability of the parameters of interest.

5.2.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.2.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Several target analytes were detected in the preparation blanks. The table below lists the target analytes detected in the preparation blanks and any qualification issued.

Analyte	PB (mg/L)	Data Qualification
Total Metals		
WG232567/ WG232742		
Total Aluminum	0.0013	None. All total aluminum results were reported at concentrations >5x the preparation blank concentration. Therefore, data qualification was not necessary.
WG233352		
Total Iron	0.024	The total iron result for sample CDW-1 was qualified as non-detect (U) at the reporting limit.

PB – Preparation Blank mg/L – Milligrams per Liter U – Non-detect

Calibration Blanks

Several target analytes were detected in various CCBs for the metals analysis. The table below lists the analytes detected in the CCBs associated with the samples reported in this SDG and any qualification issued.

Analyte	CCB1 (mg/L)	CCB2 (mg/L)	CCB3 (mg/L)	Data Qualification
Total Metals				
WG232742				
Total Aluminum		0.0036		None. Associated sample total aluminum results were reported at concentrations greater than five times positive amounts found in the CCBs.
Dissolved Metals				
WG232867				
Dissolved Lead		0.00017		All detectable dissolved lead results for the samples reported in this data package were qualified as nondetect (U) at the reporting limit.
General chemistry				
WG233068				
Nitrate/ Nitrite as N	0.023			The nitrate/ nitrite as N results for samples CDW-1 and SW14 were qualified as nondetect (U) at the reporting limit.

CCB – Continuing Calibration Blank mg/L – Milligrams per Liter U – Non-detect

- An empty cell indicates that the analyte was not detected with an absolute value > IDL or that samples were not bracketed by this CCB.

5.2.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.2.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.2.7 Serial Dilution

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.2.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.2.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.3 ACZ Data Package L65087

Data package L65087 contained the analytical results for four samples and one trip blank. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L65087-01	SW08	MS/MSD – Dissolved Calcium, Dissolved Iron, Dissolved Magnesium, Dissolved Potassium, Dissolved Sodium
L65087-02	SW07	MS/MSD – Total Cadmium, Total Copper, Total Lead, Total Manganese MS – TOC, Sulfate
L65087-03	TB-1	MS/MSD – Total Aluminum MD – TOC, Sulfate MS – Nitrate/Nitrite as N
L65087-04	SW09	MD – Alkalinity as CaCO3, Nitrate/ Nitrite as N

Laboratory ID	Field ID	QC Designation
L65087-05	SW10	MS/MSD – Dissolved Aluminum, Dissolved Cadmium, Dissolved Copper, Dissolved Lead, Dissolved Manganese

MD – Method Duplicate
MSD – Matrix Spike Duplicate
TOC – Total Organic Carbon
MS – Matrix Spike
PDS – Post Digestion Spike

5.3.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.3.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 4.5°C upon receipt, within the ≤6°C temperature criterion.

5.3.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.3.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Several target analytes were detected in the preparation blanks. The table below lists the target analytes detected in the preparation blanks and any qualification issued.

Analyte	PB (mg/L)	Data Qualification
Total Metals		
WG233277		
Total Aluminum	0.0025	None. All total aluminum results were reported at concentrations >5x the preparation blank concentration. Therefore, data qualification was not necessary.

PB- Preparation Blank
mg/L – Milligrams per Liter

Calibration Blanks

Several targets analytes were detected in various CCBs for the metals analysis. The table below lists the analytes detected in the CCBs associated with the samples reported in this SDG and any qualification issued.

Analyte	CCB1 (mg/L)	CCB2 (mg/L)	CCB3 (mg/L)	Data Qualification
Total Metals				
WG232744				
Total Lead	0.00015	0.00014	0.00022	None. Associated sample total lead results were reported as non-detect.

CCB – Continuing Calibration Blank mg/L – Milligrams per Liter

- An empty cell indicates that the analyte was not detected with an absolute value > IDL or that samples were not bracketed by this CCB.

5.3.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.3.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.3.7 Serial Dilution

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.3.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.3.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.4 ACZ Data Package L65088

Data package L65088 contained the analytical results for four samples and one field duplicate. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L65088-01	BDW-4	MS/MSD – Total Iron
L65088-02	SW313	
L65088-03	SW15	
L65088-04	SW04	MS – Total Phosphorus, DOC, Chloride
L65088-05	ER-1	MD – DOC, Chloride, Total Phosphorus

MS – Matrix Spike
MSD – Matrix Spike Duplicate
DOC – Dissolved Organic Carbon

5.4.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.4.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 1.9°C upon receipt, within the ≤6°C temperature criterion.

5.4.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.4.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

A target analyte was detected in the preparation blank. The table below lists the target analyte detected in the preparation blank and any qualification issued.

Analyte	PB (mg/L)	Data Qualification
Total Metals		
WG232961		
Total Aluminum	0.0104	None. All total aluminum results were reported at concentrations >5x the preparation blank concentration. Therefore, data qualification was not necessary.

PB – Preparation Blank mg/L – Milligrams per Liter

Calibration Blanks

Targets analytes were not detected in the CCBs for the metals analyses or general chemistry analyses. Therefore, data qualification was not necessary.

5.4.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.4.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.4.7 Serial Dilution

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.4.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as

the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.4.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.5 ACZ Data Package L66007

Data package L66007 contained the analytical results for five surface water samples. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L66007-01	SW-03-U	
L66007-02	SW-02-U	
L66007-03	SW-08-U	
L66007-04	SW-12-U	
L66007-05	SW-01-U	

ID - Identification

5.5.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.5.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 3.1°C upon receipt, within the ≤6°C temperature criterion.

5.5.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.5.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Target analytes were not detected in the preparation blanks. Therefore, data qualification was not necessary.

Calibration Blanks

Several targets analytes were detected in various CCBs for the metals analysis. The table below lists the target analytes detected in the CCBs associated with the samples reported in this SDG and any qualification issued.

Analyte	CCB1 (mg/L)	CCB2 (mg/L)	CCB3 (mg/L)	Data Qualification
Dissolved Metals				
WG235933				
Dissolved Manganese	0.00111			None. The associated dissolved manganese result was reported as non-detect. Therefore, data qualification was not necessary.

CCB – Continuing Calibration Blank mg/L – Milligrams per Liter

- An empty cell indicates that the analyte was not detected with an absolute value > IDL or that samples were not bracketed by this CCB.

5.5.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.5.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.5.7 Serial Dilution

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.5.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.5.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.6 ACZ Data Package L66467

Data package L66467 contained the analytical results for four surface water samples. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L66467-01	SW-04-U	
L66467-02	SW-05-U	
L66467-03	SW-09-U	
L66467-04	SW-10-U	

ID - Identification

5.6.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.6.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 3.6°C upon receipt, within the ≤6°C temperature criterion.

5.6.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.6.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Target analytes were not detected in the preparation blanks. Therefore, data qualification was not necessary.

Calibration Blanks

Target analytes were not detected in the CCBs for the dissolved metals analyses. Therefore, data qualification was not necessary.

5.6.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.6.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.6.7 Serial Dilutions

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.6.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.6.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.7 ACZ Data Package L66778

Data package L66778 contained the analytical results for three surface water samples, one trip blank sample, and one field duplicate sample. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L66778-01	SW312-U	MS/MSD – Dissolved Calcium, Dissolved Iron, Dissolved Magnesium
L66778-02	TB-1-U	
L66778-03	SW11-U	
L66778-04	SW14-U	
L66778-05	SW15-U	

ID – Identification MS – Matrix Spike MSD – Matrix Spike Duplicate

5.7.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.7.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 2.3°C upon receipt, within the ≤6°C temperature criterion.

5.7.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.7.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Target analytes were not detected in the preparation blanks. Therefore, data qualification was not necessary.

Calibration Blanks

Target analytes were not detected in the CCBs for the dissolved metals analyses. Therefore, data qualification was not necessary.

5.7.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.7.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.7.7 Serial Dilutions

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.7.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.7.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.8 ACZ Data Package L67069

Data package L67069 contained the analytical results for four surface water samples and one field duplicate sample. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L67069-01	SW-07-U	
L67069-02	SW-313-U	
L67069-03	SW-13-U	
L67069-04	BDW-4-U	
L67069-05	SW06-U	

ID - Identification

5.8.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.8.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 2.1°C upon receipt, within the ≤6°C temperature criterion.

5.8.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.8.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Target analytes were not detected in the preparation blanks. Therefore, data qualification was not necessary.

Calibration Blanks

The table below lists the target analytes detected in the CCBs associated with the samples reported in this SDG and any qualification issued.

Analyte	CCB1 (mg/L)	CCB2 (mg/L)	CCB3 (mg/L)	Data Qualification
Dissolved Metals				
WG239097				
Dissolved Manganese	0.00066			The dissolved manganese result for sample SW-13-U was qualified as non-detect (U) at the reporting limit. All other associated dissolved manganese results were reported at concentrations >5x the CCB concentration or were reported as non-detect.

CCB – Continuing Calibration Blank mg/L – milligrams per Liter U – Non-detect

- An empty cell indicates that the analyte was not detected with an absolute value > IDL or that samples were not bracketed by this CCB.

5.8.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.8.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.8.7 Serial Dilutions

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.8.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.8.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

5.9 ACZ Data Package L67712

Data package L67712 contained the analytical results for two samples. The table below lists the laboratory IDs, corresponding field IDs, and QC designations.

Laboratory ID	Field ID	QC Designation
L67712-01	CDW-1-U	
L67712-02	ER-1-U	

ID - Identification

5.9.1 Overall Assessment

The data are considered usable for meeting project objectives with the qualifications noted in the following narrative. The data qualifiers and associated qualifier and bias codes were hand-entered on the sample reporting forms. The sample reporting forms are included in Appendix A.

5.9.2 COC and Sample Receipt Documentation

The samples were shipped to ACZ under COC. The laboratory sample custodian noted that all samples were received intact. The cooler temperature was 2.4°C upon receipt, within the ≤6°C temperature criterion.

5.9.3 Holding Times

The samples were prepared and analyzed within the required holding time limits. Therefore, data qualification was not considered necessary.

5.9.4 Preparation Blanks and Calibration Blanks

Preparation Blanks

Target analytes were not detected in the preparation blanks. Therefore, data qualification was not necessary.

Calibration Blanks

Several targets analytes were detected in various CCBs for the dissolved metals analyses. The table below lists the target analytes detected in the CCBs associated with the samples reported in this SDG and any qualification issued.

Analyte	CCB1 (mg/L)	CCB2 (mg/L)	CCB3 (mg/L)	Data Qualification
Dissolved Aluminum		0.001		None. All dissolved aluminum results were reported at concentrations >5x the CCB concentration. Therefore, data qualification was not necessary.
Dissolved Cadmium		0.00019		The dissolved cadmium result for sample CDW-1-U was qualified as non-detect (U) at the reported value. All other associated dissolved cadmium results were reported as non-detect.
Dissolved Copper		0.00052		The dissolved copper result for sample ER-1-U was qualified as non-detect (U) at the reporting limit. All other associated dissolved copper results were reported at concentrations >5x the CCB concentration.
Dissolved Lead		0.0005	0.00024	None. The associated dissolved lead results were reported as non-detect.

CCB – Continuing Calibration Blank mg/L – Milligrams per Liter U – Non-detect

- An empty cell indicates that the analyte was not detected with an absolute value > IDL or that samples were not bracketed by this CCB.

5.9.5 Duplicate Sample Analysis

Method duplicate results are discussed in Section 6.

5.9.6 Matrix Spike Analysis

Matrix spike and matrix spike duplicate results are discussed in Section 6.

5.9.7 Serial Dilutions

A serial dilution is required for ILMO4.0 for all sample delivery groups, but is only pertinent to analytes present at greater than 50x the detection limit. No results were reported at concentrations greater than 50x MDL for samples in this package; therefore, not having a serial dilution reported is not considered to affect the quality or usability of the data. A serial dilution is not required in method 200.8.

5.9.8 Post Digestion Spike

For ILMO4.0, a post digestion spike is required when the matrix spike recovery is outside the acceptance limits of 75-125%. A post digestion spike was not analyzed for ICP analyses by 200.7. This is not considered to affect the data quality or usability as the metal matrix spike recoveries were all within the acceptance limits. A post digestion spike is not required in method 200.8.

5.9.9 Internal Standards

All internal standard (IS) recoveries were within the acceptance limits of 60-125%. Data qualification was not necessary.

6. METHOD & FIELD QUALITY PARAMETERS

The results obtained for the method and field quality control samples are discussed in the sections below.

6.1 Method Quality Parameters

Method Duplicate

The table below lists the samples for which method duplicates were performed.

Analyses	Samples
Alkalinity as $CaC0_3$	SW01, SW11, SW09
Chloride	SW01, SW14, ER-1
Sulfate	SW01, TB-1
Dissolved Organic Carbon	SW02, SW14, ER-1
Total Phosphorus	SW312, ER-1
Nitrate/ Nitrite as N	SW14, SW09
Total Organic Carbon	TB-1

The concentration – dependent evaluation criteria listed in Table 3-1 were met for all analytes. Therefore, data qualification was not necessary. ER-1 and TB-1 were a rinsate blank sample and a field blank sample, respectively. As such, the duplicate analyses are not considered appropriate to the samples or the site matrix. They should not be used on duplicate or MS/MSD analyses.

Matrix Spike and matrix Spike Duplicate

The table below lists the samples for which matrix spike and/or matrix spike duplicates were performed.

Analyses	Samples
0.45 um Filtered Samples	
Dissolved Metals	SW01 (Potassium), SW13 (Aluminum, Calcium, Copper, Lead, Manganese), SW08 (Calcium, Iron, Magnesium, Potassium, Sodium) SW10 (Aluminum, Cadmium, Copper, Lead, Manganese)
Total Metals	CDW-1 (Iron), SW12 (Aluminum, Cadmium, Copper, Lead, Manganese) SW07 (Cadmium, Copper, Lead, Manganese) TB-1 (Aluminum), BDW-4 (Iron)
Dissolved Organic Carbon	SW01, CDW-1, SW04
Total Organic Carbon	SW06A, CDW-1, SW07
Total Phosphorus	SW12, SW04
Nitrate/ Nitrite as N	SW13, TB-1
Chloride	SW14, SW04
Sulfate	SW07
0.001 um Filtered Samples (Sample ID appended with a "U")	
Dissolved Metals	SW312-U (Calcium, Iron, Magnesium)

With the exceptions listed in the table below, all matrix spike and matrix spike duplicate recoveries were within acceptance range of 75-125%. Sample TB-1 was a field blank sample. As such, the matrix spike and matrix spike duplicate analyses are not considered appropriate to the sample and site matrix. Sample TB-1 should not be used for matrix spike and matrix spike duplicate analyses.

Sample	Analyte	MS %R	Data Qualification
L65087			
SW07	Sulfate	0 %	As the percent recovery was <30%, all non-detect sulfate results in this sampling event were qualified as unusable (R). All detected sulfate results were qualified as estimated (J) to reflect the potential low bias.

L65088			
SW04	Total Phosphorus	131.8 %	As greater than 35% of the total phosphorus MS/MSD recoveries were outside of acceptance limits, detected total phosphorus results for all samples in this sampling event were qualified as estimated (J) to reflect the potential high bias.

MS – Matrix Spike %R – Percent Recovery R – Rejected J – Estimated

6.2 Field Quality Parameters

Rinsate Blank

One rinsate blank was collected with this sampling event (ER-1). After accounting for field blank contamination, all target analytes were reported as non-detect in the associated rinsate blank, with the exceptions listed in the table below.

Analyte	Concentration (mg/L)	Data Qualification
Dissolved Aluminum	0.002	The listed analytical results reported at concentrations <5x the field blank contamination were qualified as non-detect (U RB-I) at the reporting limit or reported value, whichever is greater.
Total Lead	0.0003	
Dissolved Sodium	3.4	
Bicarbonate Alkalinity	3	
Hydroxide Alkalinity	3	
Chloride	3	

U – Non-detect FB – Field blank contamination. I – Indeterminate Bias

Field Blank

One field blank was collected with this sampling event (TB-1). With the exceptions listed in the table below, all target analytes were reported as non-detect in the associated field blank.

Analyte	Concentration (mg/L)	Data Qualification
Total Aluminum	0.001	The listed analytical results reported at concentrations <5x the field blank contamination were qualified as non-detect (U MB-I) at the reporting limit or reported value, whichever is greater.
Dissolved Cadmium	0.007	
Total Copper	0.0012	
Total Manganese	0.0006	

U – Non-detect FB – Field blank contamination. I – Indeterminate Bias

Field Duplicate Agreement

The field duplicate sample pairs collected during this sampling event are listed in the table below.

Field Duplicate Pair

SW-12/ SW-312
SW-12U/ SW-312U (split of sample SW-12)
SW-13/ SW-313
SW-13-U/ SW-313-U (split of sample SW-13)

With the exceptions listed in the table below, all field duplicate results satisfied the applicable evaluation criterion in Table 3-1. This indicates an acceptable level of overall sampling and analysis precision.

Field Duplicate Pair	Analyte	Criterion	Data Qualification
SW13/ SW313	Total Aluminum	RPD ≤50% or Absolute Difference ≤3xRL	As the absolute difference between the field duplicate pair results was >3xRL, the total aluminum results for samples SW13 and SW313 were qualified as estimated (J/UJ).
	Total Iron		As the RPD between the field duplicate pair results was 187%, the total iron results were for samples SW13 and SW313 were qualified as estimated (J/UJ).
	Dissolved Magnesium		As the absolute difference between the field duplicate pair results was >3xRL, the listed analytical results for samples SW13 and SW313 were qualified as estimated (J/UJ).
	Dissolved Sodium		
	Total Phosphorus		

RPD – Relative Percent Difference RL – Reporting Limit J/UJ - Estimated

7. OVERALL ASSESSMENT

The sample data are considered to be acceptable for use in reconciliation with project objectives as qualified. A general overall assessment of each of the QAP's data quality assurance objectives is provided below.

7.1 Reporting Limits

Reporting limits (RLs) are established by the analytical laboratory based on the method detection limits (MDLs), historical data, and comparison to EPA limits for the respective methods. All reporting limits satisfied the reporting limit requirements.

Analyte	MDL (mg/l)	RL (mg/l)	MCL (mg/l)
Dissolved Aluminum	0.001	0.005	0.05 to 0.2[3]
Total Aluminum	0.005	0.03	0.05 to 0.2[3]
Total Cadmium	0.0001	0.0005	0.005
Dissolved Cadmium	0.0001	0.0005	0.005
Dissolved Calcium	0.2	1	---
Dissolved Copper	0.0005	0.003	1.3[1]
Total Copper	0.0005	0.003	1.3[1]
Dissolved Iron	0.02	0.05	0.3[3]
Total Iron	0.02	0.05	0.3[3]
Dissolved Lead	0.0001	0.0005	0.015[1]
Total Lead	0.0001	0.0005	0.015[1]
Dissolved Magnesium	0.2	1	---
Dissolved Manganese	0.0005	0.003	0.05[3]
Total Manganese	0.0005	0.003	0.05[3]
Dissolved Potassium	0.3	2	---
Dissolved Sodium	0.3	2	---
Alkalinities	2	20	---
DOC	1	5	---
TOC	1	5	---
Chloride	1	5	250[3]
Nitrate/ Nitrite as N	0.02	0.1	1[2]
Total Phosphorus	0.01	0.05	---
Sulfate	1	5	250[3]

MDL- Method Detection Limit PQL – Practical Quantitation Limit MCL – Maximum Contaminant Level
mg/L – Milligrams per Liter

[1] Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of the tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

[2] The MCL value is for Nitrite as N.

3 MCL values were derived from National Standard Drinking water Regulations – Secondary Standards.

Note: MCLs are based on total fractions.

7.2 Accuracy

Accuracy is defined as the degree of agreement of a measurement to an accepted reference or true value. Accuracy was measured as the percent recovery (%R) of an analyte in a reference standard or spiked sample.

All laboratory control samples and all calibration standards and were within acceptance limits demonstrating acceptable overall accuracy of the analytical system.

With the exceptions of the high total phosphorus MS recovery for sample SW04 and the low sulfate recovery for sample SW07, all matrix spike recoveries were within the acceptance limits.

7.3 Precision

Precision is defined as the agreement between a set of replicate measurements without assumption or knowledge of the true value. Precision of laboratory measurements was evaluated by the comparison of sample/sample duplicate results.

With two exceptions, all of the laboratory duplicate results satisfied the applicable evaluation criteria. Therefore, the overall level of precision demonstrated by the analyses is considered to be acceptable

Precision of field sampling and laboratory analysis was evaluated by the comparison of field duplicate sample results. The agreement shown by the field duplicate results is indicative of an acceptable level of overall sampling and analysis precision.

7.4 Completeness

All of the results are considered usable as qualified. As such, the analytical completeness for the supplemental sampling, defined as the ratio of the number of valid analytical results (valid analytical results include estimated values) to the total number of analytical results requested on samples submitted for analysis, is greater than 100% which satisfies the QAP requirement of 80%. All valid results are considered acceptable for use in meeting project objectives.

7.5 Representativeness

Representativeness is the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an

environmental condition. Representativeness was maintained during sampling efforts by completing sampling in compliance with the FSP, and relevant SOPs.

Consistent, uniform sample collection protocols, including such tasks as storage, preservation and transportation, were used to assure that the representativeness of the samples gathered during the AOC met project objectives. Proper documentation in the field and laboratory verified that protocols were followed and that sample identification as well as integrity was preserved.

7.6 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data are comparable if collection techniques, measurement procedures, method, and reporting limits are equivalent for the samples within a sample set. As the samples in this set were analyzed in accordance with Method 200.7 and 200.8 and quality control measures described in the methods, and acceptable levels of overall accuracy and precision were attained, the data within this set are considered to be comparable to each other.

APPENDIX A

DATA REPORTING FORMS

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW01

ACZ Sample ID: ***L65006-01***
Date Sampled: *09/11/07 10:30*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 13:43	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 13:20	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:00	jjr

Metals Analysis

Parameter	EPA Method		Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS		0.477		*	mg/L	0.001	0.005	09/19/07 5:03	msh
Aluminum, total	M200.8 ICP-MS		2.110		*	mg/L	0.005	0.03	09/19/07 13:41	jjr
Cadmium, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/19/07 5:03	msh
Cadmium, total	M200.8 ICP-MS	J SQL-I	0.0001	B		mg/L	0.0001	0.0005	09/18/07 9:56	jjr
Calcium, dissolved	M200.7 ICP		11.0			mg/L	0.2	1	09/21/07 0:37	djt
Copper, dissolved	M200.8 ICP-MS		0.0193			mg/L	0.0005	0.003	09/19/07 5:03	msh
Copper, total	M200.8 ICP-MS		0.0194			mg/L	0.0005	0.003	09/18/07 9:56	jjr
Iron, dissolved	M200.7 ICP		0.15			mg/L	0.02	0.05	09/21/07 0:37	djt
Iron, total	M200.7 ICP		1.27		*	mg/L	0.02	0.05	09/22/07 4:33	erf
Lead, dissolved	M200.8 ICP-MS	U CC ~~MB~~-I	~~0.0003~~ 0.0005	B		mg/L	0.0001	0.0005	09/19/07 5:03	msh
Lead, total	M200.8 ICP-MS	U RB-I	~~0.0007~~ 0.0007			mg/L	0.0001	0.0005	09/18/07 9:56	jjr
Magnesium, dissolved	M200.7 ICP		4.5			mg/L	0.2	1	09/21/07 0:37	djt
Manganese, dissolved	M200.8 ICP-MS		0.0085		*	mg/L	0.0005	0.003	09/19/07 5:03	msh
Manganese, total	M200.8 ICP-MS		0.0105			mg/L	0.0005	0.003	09/18/07 9:56	jjr
Potassium, dissolved	M200.7 ICP	J SQL-I	1.9	B		mg/L	0.3	2	09/25/07 19:07	erf
Sodium, dissolved	M200.7 ICP	U RB-I	8.4			mg/L	0.3	2	09/21/07 0:37	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW01

ACZ Sample ID: ***L65006-01***
Date Sampled: *09/11/07 10:30*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		26			mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		26			mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	12		*	mg/L	1	5	09/20/07 21:08	jag
Carbon, total organic (TOC)	415.1 / SM5310B	11		*	mg/L	1	5	09/22/07 0:10	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		47.4			%			10/01/07 0:00	calc
Sum of Anions		0.5			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		1.4			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	~~J SQL I~~ 5	~~B~~	U RB-I	mg/L	1	5	09/20/07 14:41	mls\
Hardness as CaCO3	SM2340B - Calculation	46			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	EK 5/28/08	U	*	mg/L	0.02	0.1	09/21/07 21:56	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J SQL, MS-H	~~J SQL I~~ 0.04	B	*	mg/L	0.01	0.05	09/25/07 16:42	mls
Sulfate	375.4 - Turbidimetric	U CCB, ~~MS~~ 5-I	B	*	mg/L	1	5	09/24/07 11:29	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW02

ACZ Sample ID: ***L65006-02***
Date Sampled: *09/11/07 11:45*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 13:48	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 13:33	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:10	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.112		*	mg/L	0.001	0.005	09/19/07 5:09	msh
Aluminum, total	M200.8 ICP-MS	0.742		*	mg/L	0.001	0.005	09/18/07 10:02	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:09	msh
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/18/07 10:02	jjr
Calcium, dissolved	M200.7 ICP	16.8			mg/L	0.2	1	09/21/07 0:41	djt
Copper, dissolved	M200.8 ICP-MS	0.0139			mg/L	0.0005	0.003	09/19/07 5:09	msh
Copper, total	M200.8 ICP-MS	0.0140			mg/L	0.0005	0.003	09/18/07 10:02	jjr
Iron, dissolved	M200.7 ICP	0.09			mg/L	0.02	0.05	09/21/07 0:41	djt
Iron, total	M200.7 ICP	0.51		*	mg/L	0.02	0.05	09/22/07 4:37	erf
Lead, dissolved	M200.8 ICP-MS	U CC MB-I ~~0.0002~~ 0.0005	B		mg/L	0.0001	0.0005	09/19/07 5:09	msh
Lead, total	M200.8 ICP-MS	J SQL-I 0.0004	B		mg/L	0.0001	0.0005	09/18/07 10:02	jjr
Magnesium, dissolved	M200.7 ICP	5.1			mg/L	0.2	1	09/21/07 0:41	djt
Manganese, dissolved	M200.8 ICP-MS	0.0350		*	mg/L	0.0005	0.003	09/19/07 5:09	msh
Manganese, total	M200.8 ICP-MS	0.0343			mg/L	0.0005	0.003	09/18/07 10:02	jjr
Potassium, dissolved	M200.7 ICP	2.7			mg/L	0.3	2	09/25/07 19:19	erf
Sodium, dissolved	M200.7 ICP	U RB-I 13.3			mg/L	0.3	2	09/21/07 0:41	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW02

ACZ Sample ID: ***L65006-02***
Date Sampled: *09/11/07 11:45*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		40			mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		40			mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/20/07 21:37	jag
Carbon, total organic (TOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/22/07 0:25	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		26.7			%			10/01/07 0:00	calc
Sum of Anions		1.1			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		1.9			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E ~~J SQL-I~~ EK 5/27/08	~~25~~	~~B~~	U RB-I	mg/L	1	5	09/20/07 14:43	mls\
Hardness as CaCO3	SM2340B - Calculation	63			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved EK 5/28/08		U	*	mg/L	0.02	0.1	09/21/07 21:58	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) ~~J SQL-I~~ J SQL, MS-H	0.02	B	*	mg/L	0.01	0.05	09/25/07 16:43	mls
Sulfate	375.4 - Turbidimetric J MS-L	13		*	mg/L	1	5	09/24/07 11:30	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW03

ACZ Sample ID: ***L65006-03***
Date Sampled: *09/11/07 12:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 13:54	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 13:47	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:20	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.081		*	mg/L	0.001	0.005	09/19/07 5:15	msh
Aluminum, total	M200.8 ICP-MS	0.384		*	mg/L	0.001	0.005	09/18/07 10:20	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:15	msh
Cadmium, total	M200.8 ICP-MS J SQL-I	0.0001	B		mg/L	0.0001	0.0005	09/18/07 10:20	jjr
Calcium, dissolved	M200.7 ICP	26.0			mg/L	0.2	1	09/21/07 0:45	djt
Copper, dissolved	M200.8 ICP-MS	0.0145			mg/L	0.0005	0.003	09/19/07 5:15	msh
Copper, total	M200.8 ICP-MS	0.0152			mg/L	0.0005	0.003	09/18/07 10:20	jjr
Iron, dissolved	M200.7 ICP	0.12			mg/L	0.02	0.05	09/21/07 0:45	djt
Iron, total	M200.7 ICP	0.38		*	mg/L	0.02	0.05	09/22/07 4:41	erf
Lead, dissolved	M200.8 ICP-MS U CC MB-I	~~0.0005~~ 0.0005			mg/L	0.0001	0.0005	09/19/07 5:15	msh
Lead, total	M200.8 ICP-MS	0.0011			mg/L	0.0001	0.0005	09/18/07 10:20	jjr
Magnesium, dissolved	M200.7 ICP	7.3			mg/L	0.2	1	09/21/07 0:45	djt
Manganese, dissolved	M200.8 ICP-MS	0.0501		*	mg/L	0.0005	0.003	09/19/07 5:15	msh
Manganese, total	M200.8 ICP-MS	0.0511			mg/L	0.0005	0.003	09/18/07 10:20	jjr
Potassium, dissolved	M200.7 ICP	3.3			mg/L	0.3	2	09/25/07 19:23	erf
Sodium, dissolved	M200.7 ICP	18.4			mg/L	0.3	2	09/21/07 0:45	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW03

ACZ Sample ID: ***L65006-03***
Date Sampled: *09/11/07 12:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		58			mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		58			mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/20/07 22:05	jag
Carbon, total organic (TOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/22/07 0:39	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		19.1			%			10/01/07 0:00	calc
Sum of Anions		1.9			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		2.8			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	~~J SQL-I~~ ~~25~~ 5	~~B~~	U RB-J	mg/L	1	5	09/20/07 14:44	mls\
Hardness as CaCO3	SM2340B - Calculation	95			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	EK 5/29/08	U	*	mg/L	0.02	0.1	09/21/07 21:59	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J SQL, MS-H	~~J SQL-I~~ 0.05	B	*	mg/L	0.01	0.05	09/25/07 16:44	mls
Sulfate	375.4 - Turbidimetric	J MS-L 32		*	mg/L	5	30	09/24/07 12:28	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW05

ACZ Sample ID: ***L65006-04***
Date Sampled: *09/11/07 15:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 15:55	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:30	jjr
Total Hot Plate Digestion	M200.2 ICP							09/20/07 14:01	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	11.20			mg/L	0.05	0.3	09/20/07 20:02	msh
Aluminum, total	M200.8 ICP-MS	11.90		*	mg/L	0.05	0.3	09/19/07 13:47	jjr
Cadmium, dissolved	M200.8 ICP-MS	0.0038			mg/L	0.0001	0.0005	09/19/07 5:21	msh
Cadmium, total	M200.8 ICP-MS	0.0040			mg/L	0.0001	0.0005	09/18/07 10:26	jjr
Calcium, dissolved	M200.7 ICP	69.2			mg/L	0.2	1	09/21/07 0:50	djt
Copper, dissolved	M200.8 ICP-MS	1.22			mg/L	0.03	0.1	09/20/07 20:02	msh
Copper, total	M200.8 ICP-MS	1.16			mg/L	0.03	0.1	09/19/07 13:47	jjr
Iron, dissolved	M200.7 ICP	0.18			mg/L	0.02	0.05	09/21/07 0:50	djt
Iron, total	M200.7 ICP	0.19		*	mg/L	0.02	0.05	09/22/07 4:45	erf
Lead, dissolved	M200.8 ICP-MS	CC U ~~MB-I~~ ~~0.0003~~ 0.0005	B		mg/L	0.0001	0.0005	09/19/07 5:21	msh
Lead, total	M200.8 ICP-MS	~~J SQL-I~~ ~~0.00035~~ EK 5/27/08	~~B~~	U RB-I	mg/L	0.0001	0.0005	09/18/07 10:26	jjr
Magnesium, dissolved	M200.7 ICP	46.7			mg/L	0.2	1	09/21/07 0:50	djt
Manganese, dissolved	M200.8 ICP-MS	4.41			mg/L	0.03	0.1	09/20/07 20:02	msh
Manganese, total	M200.8 ICP-MS	4.64			mg/L	0.03	0.1	09/19/07 13:47	jjr
Potassium, dissolved	M200.7 ICP	4.1			mg/L	0.3	2	09/25/07 19:28	erf
Sodium, dissolved	M200.7 ICP	10.3			mg/L	0.3	2	09/21/07 0:50	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW05

ACZ Sample ID: ***L65006-04***
Date Sampled: *09/11/07 15:15*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity			U		mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/20/07 22:19	jag
Carbon, total organic (TOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/22/07 1:07	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		8.0			%			10/01/07 0:00	calc
Sum of Anions		8.0			meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		8.4			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E ~~J SQL-I~~ EK 5/27/08	~~25~~	~~B~~	U RB-J	mg/L	1	5	09/20/07 14:45	mls\
Hardness as CaCO3	SM2340B - Calculation	365			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1.40		*	mg/L	0.02	0.1	09/21/07 22:00	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	09/25/07 18:12	mls
Sulfate	375.4 - Turbidimetric J MS-L	380		*	mg/L	20	100	09/24/07 12:31	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW06A

ACZ Sample ID: ***L65006-05***
Date Sampled: *09/11/07 16:50*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 15:57	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP							09/20/07 14:15	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/17/07 17:40	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.138		*	mg/L	0.001	0.005	09/19/07 5:27	msh
Aluminum, total	M200.8 ICP-MS	0.129		*	mg/L	0.001	0.005	09/18/07 10:32	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:27	msh
Cadmium, total	M200.8 ICP-MS J SQL-I	0.0001	B		mg/L	0.0001	0.0005	09/18/07 10:32	jjr
Calcium, dissolved	M200.7 ICP	5.9			mg/L	0.2	1	09/21/07 0:54	djt
Copper, dissolved	M200.8 ICP-MS	0.0301			mg/L	0.0005	0.003	09/19/07 5:27	msh
Copper, total	M200.8 ICP-MS	0.0278			mg/L	0.0005	0.003	09/18/07 10:32	jjr
Iron, dissolved	M200.7 ICP J SQL-I	0.05	B		mg/L	0.02	0.05	09/21/07 0:54	djt
Iron, total	M200.7 ICP	0.06		*	mg/L	0.02	0.05	09/22/07 4:50	erf
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 5:27	msh
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/18/07 10:32	jjr
Magnesium, dissolved	M200.7 ICP	2.6			mg/L	0.2	1	09/21/07 0:54	djt
Manganese, dissolved	M200.8 ICP-MS	0.0133		*	mg/L	0.0005	0.003	09/19/07 5:27	msh
Manganese, total	M200.8 ICP-MS	0.0037			mg/L	0.0005	0.003	09/18/07 10:32	jjr
Potassium, dissolved	M200.7 ICP	2.1			mg/L	0.3	2	09/25/07 19:40	erf
Sodium, dissolved	M200.7 ICP	3.9	U RB-I		mg/L	0.3	2	09/21/07 0:54	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW06A

ACZ Sample ID: ***L65006-05***
Date Sampled: *09/11/07 16:50*
Date Received: *09/13/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		EK 5/27/08 ~~J SQL-I~~ 20	B	U RB-I	mg/L	2	20	09/20/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/20/07 0:00	lcp
Total Alkalinity		EK 5/27/08 ~~J SQL-I~~ 20	~~B~~	U R B-I	mg/L	2	20	09/20/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	13		*	mg/L	1	5	09/20/07 23:02	jag
Carbon, total organic (TOC)	415.1 / SM5310B	13		*	mg/L	1	5	09/22/07 1:21	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		n/a			%			10/01/07 0:00	calc
Sum of Anions		J SQL-I 0.1	B		meq/L	0.1	0.5	10/01/07 0:00	calc
Sum of Cations		0.7			meq/L	0.1	0.5	10/01/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	EK 5/27/08 ~~J SQL-I~~ 5	U RB-I		mg/L	1	5	09/20/07 14:46	mls\
Hardness as CaCO3	SM2340B - Calculation	25			mg/L	1	7	10/01/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/21/07 22:01	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	EK 5/28/08 ~~J SQL-I~~ 0.01 J SQL, MS-H	B	*	mg/L	0.01	0.05	09/25/07 18:13	mls
Sulfate	375.4 - Turbidimetric	R-MS	~~U~~	~~*~~	~~mg/L~~	~~1~~	~~5~~	~~09/24/07 11:23~~	~~jlr~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: CDW-1

ACZ Sample ID: ***L65029-01***
Date Sampled: *09/12/07 08:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/25/07 16:48	aeh/jlf
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 14:57	jjr
Total Hot Plate Digestion	M200.2 ICP							09/28/07 17:21	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.052			mg/L	0.001	0.005	09/22/07 13:18	scp
Aluminum, total	M200.8 ICP-MS	0.076		*	mg/L	0.001	0.005	09/19/07 6:38	jjr
Cadmium, dissolved	M200.8 ICP-MS	0.0013			mg/L	0.0001	0.0005	09/22/07 13:18	scp
Cadmium, total	M200.8 ICP-MS	0.0013			mg/L	0.0001	0.0005	09/19/07 6:38	jjr
Calcium, dissolved	M200.7 ICP	10.2			mg/L	0.2	1	09/22/07 2:59	dtt
Copper, dissolved	M200.8 ICP-MS	0.2210			mg/L	0.0005	0.003	09/22/07 13:18	scp
Copper, total	M200.8 ICP-MS	0.2390			mg/L	0.0005	0.003	09/19/07 6:38	jjr
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/22/07 2:59	dtt
Iron, total	M200.7 ICP	U MB ~~CCB-I~~ ~~0.04~~ 0.05			mg/L	0.02	0.05	09/30/07 16:39	erf
Lead, dissolved	M200.8 ICP-MS	U CCB-I ~~0.0002~~ 0.0005			mg/L	0.0001	0.0005	09/22/07 13:18	scp
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/19/07 6:38	jjr
Magnesium, dissolved	M200.7 ICP	2.4			mg/L	0.2	1	09/22/07 2:59	dtt
Manganese, dissolved	M200.8 ICP-MS	0.0931			mg/L	0.0005	0.003	09/22/07 13:18	scp
Manganese, total	M200.8 ICP-MS	0.0944			mg/L	0.0005	0.003	09/19/07 6:38	jjr
Potassium, dissolved	M200.7 ICP	2.8		*	mg/L	0.3	2	09/23/07 20:44	erf
Sodium, dissolved	M200.7 ICP	6.8	U RB-I		mg/L	0.3	2	09/22/07 2:59	dtt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: CDW-1

ACZ Sample ID: ***L65029-01***
Date Sampled: *09/12/07 08:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity			U		mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	J SQL-I 3	B	*	mg/L	1	5	09/21/07 0:27	jag
Carbon, total organic (TOC)	415.1 / SM5310B	J SQL-I 3	B	*	mg/L	1	5	09/24/07 18:57	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		4.8			%			10/05/07 0:00	calc
Sum of Anions		1.0			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations					meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	EK 5/27/08 ~~J SQL-I~~ ~~2~~ 5	~~B~~ U RB-I		mg/L	1	5	09/24/07 14:49	jlf
Hardness as CaCO3	SM2340B - Calculation	35			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	~~J SQL-I~~ ~~0.08~~ 0.1	U CCB-I		mg/L	0.02	0.1	09/26/07 21:13	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	EK 5/15/08	U	*	mg/L	0.01	0.05	09/25/07 18:36	mls
Sulfate	375.4 - Turbidimetric	J MS-L 47		*	mg/L	5	30	09/28/07 8:24	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW12

ACZ Sample ID: ***L65029-02***
Date Sampled: *09/12/07 10:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:01	pjb
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 17:57	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:07	jjr

Metals Analysis

Parameter	EPA Method		Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS		0.139			mg/L	0.001	0.005	09/22/07 13:24	scp
Aluminum, total	M200.8 ICP-MS		10.00		*	mg/L	0.02	0.1	09/20/07 22:05	scp
Cadmium, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/22/07 13:24	scp
Cadmium, total	M200.8 ICP-MS	J SQL-I	0.0002	B		mg/L	0.0001	0.0005	09/19/07 6:43	jjr
Calcium, dissolved	M200.7 ICP		18.5			mg/L	0.2	1	09/22/07 3:03	dtt
Copper, dissolved	M200.8 ICP-MS		0.0458			mg/L	0.0005	0.003	09/22/07 13:24	scp
Copper, total	M200.8 ICP-MS		0.1880			mg/L	0.0005	0.003	09/19/07 6:43	jjr
Iron, dissolved	M200.7 ICP		0.17			mg/L	0.02	0.05	09/22/07 3:03	dtt
Iron, total	M200.7 ICP		10.60			mg/L	0.04	0.1	09/30/07 16:52	erf
Lead, dissolved	M200.8 ICP-MS	U CCB-I	~~0.0003~~ 0.0005	B		mg/L	0.0001	0.0005	09/22/07 13:24	scp
Lead, total	M200.8 ICP-MS		0.0061			mg/L	0.0001	0.0005	09/19/07 6:43	jjr
Magnesium, dissolved	M200.7 ICP		1.9			mg/L	0.2	1	09/22/07 3:03	dtt
Manganese, dissolved	M200.8 ICP-MS		0.0265			mg/L	0.0005	0.003	09/22/07 13:24	scp
Manganese, total	M200.8 ICP-MS		0.1150			mg/L	0.0005	0.003	09/19/07 6:43	jjr
Potassium, dissolved	M200.7 ICP		9.7		*	mg/L	0.3	2	09/23/07 20:48	erf
Sodium, dissolved	M200.7 ICP	~~J SQL-I~~ ~~0.5~~	2	~~B~~	U RB-I	mg/L	0.3	2	09/22/07 3:03	dtt

EK 5/27/08

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW12

ACZ Sample ID: ***L65029-02***
Date Sampled: *09/12/07 10:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		56			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		56			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/20/07 23:16	jag
Carbon, total organic (TOC)	415.1 / SM5310B J SQL-I	11	B	*	mg/L	3	20	09/24/07 19:26	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		8.3			%			10/05/07 0:00	calc
Sum of Anions		1.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.3			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E EK 5/27/09 ~~J SQL-I~~	~~2~~ 5	~~B~~	U RB-I	mg/L	1	5	09/24/07 14:49	jlf
Hardness as CaCO3	SM2340B - Calculation	54			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.64			mg/L	0.02	0.1	09/26/07 21:18	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J MS-H	0.42			mg/L	0.01	0.05	10/03/07 13:13	aml
Sulfate	375.4 - Turbidimetric R-MS	~~U~~	~~*~~		~~mg/L~~	~~1~~	~~5~~	~~09/28/07 0:22~~	~~jlf~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW312

ACZ Sample ID: ***L65029-03***
Date Sampled: *09/12/07 10:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:09	pjb
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:36	jjr
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:09	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.128			mg/L	0.001	0.005	09/22/07 13:29	scp
Aluminum, total	M200.8 ICP-MS	11.50		*	mg/L	0.05	0.3	09/20/07 22:20	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:29	scp
Cadmium, total	M200.8 ICP-MS	J SQL-I 0.0003	B		mg/L	0.0001	0.0005	09/19/07 7:07	jjr
Calcium, dissolved	M200.7 ICP	18.3			mg/L	0.2	1	09/22/07 3:07	dtt
Copper, dissolved	M200.8 ICP-MS	0.0449			mg/L	0.0005	0.003	09/22/07 13:29	scp
Copper, total	M200.8 ICP-MS	0.1950			mg/L	0.0005	0.003	09/19/07 7:07	jjr
Iron, dissolved	M200.7 ICP	0.15			mg/L	0.02	0.05	09/22/07 3:07	dtt
Iron, total	M200.7 ICP	10.40			mg/L	0.04	0.1	09/30/07 17:04	erf
Lead, dissolved	M200.8 ICP-MS	U CCB-I ~~0.0003~~ 0.0005	~~B~~		mg/L	0.0001	0.0005	09/22/07 13:29	scp
Lead, total	M200.8 ICP-MS	0.0064			mg/L	0.0001	0.0005	09/19/07 7:07	jjr
Magnesium, dissolved	M200.7 ICP	1.9			mg/L	0.2	1	09/22/07 3:07	dtt
Manganese, dissolved	M200.8 ICP-MS	0.0295			mg/L	0.0005	0.003	09/22/07 13:29	scp
Manganese, total	M200.8 ICP-MS	0.1270			mg/L	0.0005	0.003	09/19/07 7:07	jjr
Potassium, dissolved	M200.7 ICP	EK 5/27/09 9.8		*	mg/L	0.3	2	09/23/07 20:52	erf
Sodium, dissolved	M200.7 ICP	~~J SQL-I~~ ~~0.5~~ 2	~~B~~		mg/L	0.3	2	09/22/07 3:07	dtt
		U RB-I							

EK 5/7/09

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW312

ACZ Sample ID: ***L65029-03***
Date Sampled: *09/12/07 10:45*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		56			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		56			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	7		*	mg/L	1	5	09/20/07 23:30	jag
Carbon, total organic (TOC)	415.1 / SM5310B J SQL-I	8	B	*	mg/L	2	10	09/24/07 20:23	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		4.0			%			10/05/07 0:00	calc
Sum of Anions		1.2			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.3			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E EK 5/27/09 ~~J SQL-I~~ 2/5		~~B~~	U RB-I	mg/L	1	5	09/24/07 14:59	jlf
Hardness as CaCO3	SM2340B - Calculation	54			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.65			mg/L	0.02	0.1	09/26/07 21:20	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J MS-H	0.42			mg/L	0.01	0.05	10/03/07 12:44	aml
Sulfate	375.4 - Turbidimetric R-MS		U	*	mg/L	1	5	09/28/07 8:22	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting

Project ID: OG01XB

Sample ID: SW11

ACZ Sample ID: ***L65029-04***

Date Sampled: *09/12/07 11:15*

Date Received: *09/14/07*

Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:17	pjb
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:21	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:45	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.186			mg/L	0.001	0.005	09/22/07 13:35	scp
Aluminum, total	M200.8 ICP-MS	20.20		*	mg/L	0.05	0.3	09/20/07 22:25	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:35	scp
Cadmium, total	M200.8 ICP-MS	J SQL-I 0.0004	B		mg/L	0.0001	0.0005	09/19/07 7:12	jjr
Calcium, dissolved	M200.7 ICP	13.8			mg/L	0.2	1	09/22/07 3:11	dtt
Copper, dissolved	M200.8 ICP-MS	0.0397			mg/L	0.0005	0.003	09/22/07 13:35	scp
Copper, total	M200.8 ICP-MS	0.2100			mg/L	0.0005	0.003	09/19/07 7:12	jjr
Iron, dissolved	M200.7 ICP	0.11			mg/L	0.02	0.05	09/22/07 3:11	dtt
Iron, total	M200.7 ICP	15.50			mg/L	0.04	0.1	09/30/07 17:08	erf
Lead, dissolved	M200.8 ICP-MS	U CCB-I ~~0.0001~~ 0.0005	B		mg/L	0.0001	0.0005	09/22/07 13:35	scp
Lead, total	M200.8 ICP-MS	0.0086			mg/L	0.0001	0.0005	09/19/07 7:12	jjr
Magnesium, dissolved	M200.7 ICP	1.8			mg/L	0.2	1	09/22/07 3:11	dtt
Manganese, dissolved	M200.8 ICP-MS	0.0326			mg/L	0.0005	0.003	09/22/07 13:35	scp
Manganese, total	M200.8 ICP-MS	0.1830			mg/L	0.0005	0.003	09/19/07 7:12	jjr
Potassium, dissolved	M200.7 ICP	8.2		*	mg/L	0.3	2	09/23/07 20:56	erf
Sodium, dissolved	M200.7 ICP	~~J SQL-I~~ ~~0.7~~ 2	~~B~~	U RB-I	mg/L	0.3	2	09/22/07 3:11	dtt

EK 5/27/08

EK 5/7/08

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW11

ACZ Sample ID: ***L65029-04***
Date Sampled: *09/12/07 11:15*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		42			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		42			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/20/07 23:44	jag
Carbon, total organic (TOC)	415.1 / SM5310B J SQL-I	8	B	*	mg/L	2	10	09/24/07 20:37	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		15.8			%			10/05/07 0:00	calc
Sum of Anions		0.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E EK 5/27/08 ~~J SQL-I~~ ~~2~~ 5		~~B~~	U RB-I	mg/L	1	5	09/24/07 15:00	jlf
Hardness as CaCO3	SM2340B - Calculation	42			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	0.68			mg/L	0.02	0.1	09/26/07 21:21	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J MS-H	0.62			mg/L	0.01	0.05	10/03/07 12:46	aml
Sulfate	375.4 - Turbidimetric R-MS	~~[illegible]~~	~~U~~	~~*~~	~~mg/L~~	~~1~~	~~5~~	~~09/28/07 8:22~~	~~jlf~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW13

ACZ Sample ID: ***L65029-05***
Date Sampled: *09/12/07 12:15*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:21	pjb
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:33	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 15:55	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.075			mg/L	0.001	0.005	09/22/07 13:41	scp
Aluminum, total	M200.8 ICP-MS	21.80	J FD-I	*	mg/L	0.05	0.3	09/20/07 22:30	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:41	scp
Cadmium, total	M200.8 ICP-MS	J SQL-I 0.0005	B		mg/L	0.0001	0.0005	09/19/07 7:16	jjr
Calcium, dissolved	M200.7 ICP	25.5			mg/L	0.2	1	09/26/07 3:07	djt
Copper, dissolved	M200.8 ICP-MS	0.0456			mg/L	0.0005	0.003	09/22/07 13:41	scp
Copper, total	M200.8 ICP-MS	0.2530			mg/L	0.0005	0.003	09/19/07 7:16	jjr
Iron, dissolved	M200.7 ICP	J SQL-I 0.03	B		mg/L	0.02	0.05	09/27/07 2:45	djt
Iron, total	M200.7 ICP	17.30	J FD-I		mg/L	0.04	0.1	09/30/07 17:13	erf
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/22/07 13:41	scp
Lead, total	M200.8 ICP-MS	0.0105			mg/L	0.0001	0.0005	09/19/07 7:16	jjr
Magnesium, dissolved	M200.7 ICP	2.6	J FD-I		mg/L	0.2	1	09/26/07 3:07	djt
Manganese, dissolved	M200.8 ICP-MS	0.0115			mg/L	0.0005	0.003	09/22/07 13:41	scp
Manganese, total	M200.8 ICP-MS	0.23			mg/L	0.03	0.1	09/22/07 1:23	scp
Potassium, dissolved	M200.7 ICP	9.1	~~J FD-I~~ EK 5/23/08		mg/L	0.3	2	09/26/07 3:07	djt
Sodium, dissolved	M200.7 ICP	~~J SQL, FD-I~~ 2	B		mg/L	0.3	2	09/27/07 2:45	djt

U RB, FD-I

EK 5/7/08

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW13

ACZ Sample ID: ***L65029-05***
Date Sampled: *09/12/07 12:15*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		48			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		48			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/21/07 0:13	jag
Carbon, total organic (TOC)	415.1 / SM5310B	J SQL-I 7	B	*	mg/L	2	10	09/24/07 20:51	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		25.9			%			10/05/07 0:00	calc
Sum of Anions		1.0			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		EK 5/27/08 1.7			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	~~J SQL-I~~ 2 5	~~B~~	U-RB-I	mg/L	1	5	09/24/07 15:00	jlf
Hardness as CaCO3	SM2340B - Calculation	74			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	EK 5/28/08 ~~1.05~~		*	mg/L	0.02	0.1	09/26/07 21:22	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J FD, MS-H	~~J FD I~~ 0.58			mg/L	0.01	0.05	10/03/07 12:48	aml
Sulfate	375.4 - Turbidimetric R-MS	~~UJ FD I~~ U EK 5/23/08			~~mg/L~~	~~1~~	~~5~~	~~09/28/07 8:22~~	~~jlf~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW14

ACZ Sample ID: ***L65029-06***
Date Sampled: *09/12/07 15:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							09/29/07 21:25	pjb
Total Hot Plate Digestion	M200.2 ICP-MS							09/18/07 16:04	jjr
Total Hot Plate Digestion	M200.2 ICP			*				09/28/07 18:45	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.299			mg/L	0.001	0.005	09/22/07 13:58	scp
Aluminum, total	M200.8 ICP-MS	2.49		*	mg/L	0.02	0.1	09/20/07 22:35	scp
Cadmium, dissolved	M200.8 ICP-MS	J SQL-I 0.0001	B		mg/L	0.0001	0.0005	09/22/07 13:58	scp
Cadmium, total	M200.8 ICP-MS	↓ 0.0003	B		mg/L	0.0001	0.0005	09/19/07 7:21	jjr
Calcium, dissolved	M200.7 ICP	7.3			mg/L	0.2	1	09/26/07 3:12	djt
Copper, dissolved	M200.8 ICP-MS	0.0487			mg/L	0.0005	0.003	09/22/07 13:58	scp
Copper, total	M200.8 ICP-MS	0.0967			mg/L	0.0005	0.003	09/19/07 7:21	jjr
Iron, dissolved	M200.7 ICP	0.16			mg/L	0.02	0.05	09/27/07 2:49	djt
Iron, total	M200.7 ICP	2.59			mg/L	0.04	0.1	09/30/07 17:17	erf
Lead, dissolved	M200.8 ICP-MS	U CCB-I ~~0.0003~~ 0.0005	B		mg/L	0.0001	0.0005	09/22/07 13:58	scp
Lead, total	M200.8 ICP-MS	0.0022			mg/L	0.0001	0.0005	09/19/07 7:21	jjr
Magnesium, dissolved	M200.7 ICP	2.0			mg/L	0.2	1	09/26/07 3:12	djt
Manganese, dissolved	M200.8 ICP-MS	0.0170			mg/L	0.0005	0.003	09/22/07 13:58	scp
Manganese, total	M200.8 ICP-MS	0.30			mg/L	0.01	0.05	09/22/07 1:28	scp
Potassium, dissolved	M200.7 ICP	8.1			mg/L	0.3	2	09/26/07 3:12	djt
Sodium, dissolved	M200.7 ICP	2.3	U RB-I		mg/L	0.3	2	09/27/07 2:49	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW14

ACZ Sample ID: ***L65029-06***
Date Sampled: *09/12/07 15:20*
Date Received: *09/14/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		22			mg/L	2	20	09/21/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/21/07 0:00	lcp
Total Alkalinity		22			mg/L	2	20	09/21/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	11		*	mg/L	1	5	09/21/07 0:56	jag
Carbon, total organic (TOC)	415.1 / SM5310B	14		*	mg/L	2	10	09/24/07 21:05	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		33.3			%			10/05/07 0:00	calc
Sum of Anions		J SQL-I 0.4	B		meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		EK 5/27/08 0.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	~~J SQL-I~~ 5	~~B~~	U AB-I	mg/L	1	5	09/24/07 15:00	jlf
Hardness as CaCO3	SM2340B - Calculation	26			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	~~J SQL-I~~ ~~0.03~~ 0.1	U CCB-I	*	mg/L	0.02	0.1	09/26/07 21:25	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)	EK 5/15/08 0.20			mg/L	0.01	0.05	10/03/07 12:49	aml
Sulfate	375.4 - Turbidimetric	J MS-H R-MS	U	*	mg/L	1	5	~~09/28/07 8:22~~	jlf

EK 5/7/08

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW08

ACZ Sample ID: ***L65087-01***
Date Sampled: *09/14/07 10:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:44	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 13:55	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 18:48	nek/wfg

Metals Analysis

Parameter	EPA Method		Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS		0.009			mg/L	0.001	0.005	09/25/07 10:31	jjr
Aluminum, total	M200.8 ICP-MS		0.027		*	mg/L	0.001	0.005	09/28/07 18:08	scp
Cadmium, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/25/07 10:31	jjr
Cadmium, total	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/21/07 12:36	scp
Calcium, dissolved	M200.7 ICP		24.5			mg/L	0.2	1	09/26/07 9:06	djt
Copper, dissolved	M200.8 ICP-MS		0.0047			mg/L	0.0005	0.003	09/25/07 10:31	jjr
Copper, total	M200.8 ICP-MS	U FB-I	~~0.0052~~	0.0052		mg/L	0.0005	0.003	09/24/07 20:11	msh
Iron, dissolved	M200.7 ICP			U		mg/L	0.02	0.05	09/26/07 9:06	djt
Iron, total	M200.7 ICP			U		mg/L	0.02	0.05	09/28/07 0:04	djt
Lead, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/25/07 10:31	jjr
Lead, total	M200.8 ICP-MS			U	*	mg/L	0.0001	0.0005	09/21/07 12:36	scp
Magnesium, dissolved	M200.7 ICP		11.6			mg/L	0.2	1	09/26/07 9:06	djt
Manganese, dissolved	M200.8 ICP-MS	J SQL-I	0.0007	B		mg/L	0.0005	0.003	09/25/07 10:31	jjr
Manganese, total	M200.8 ICP-MS	↓	0.0006	B		mg/L	0.0005	0.003	09/21/07 12:36	scp
Potassium, dissolved	M200.7 ICP		2.6			mg/L	0.3	2	09/26/07 9:06	djt
Sodium, dissolved	M200.7 ICP		16.2	U RB-I		mg/L	0.3	2	09/26/07 9:06	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW08

ACZ Sample ID: ***L65087-01***
Date Sampled: *09/14/07 10:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		120			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		120		*	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B J SQL-I	5	B	*	mg/L	1	5	09/21/07 1:53	jag
Carbon, total organic (TOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/25/07 0:10	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		9.4			%			10/05/07 0:00	calc
Sum of Anions		2.4			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.9			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E EK 5/27/08 ~~J SQL-I~~ ~~8~~ 5		~~B~~	U RB-I	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	109			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:07	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) EK 5/27/08 ~~J MS-H~~ J MS-H EK 5/28/08	0.06		*	mg/L	0.01	0.05	10/03/07 14:22	aml
Sulfate	375.4 - Turbidimetric R-MS		~~U~~	~~*~~	~~mg/L~~	~~1~~	~~5~~	~~09/27/07 8:51~~	~~jlf~~

EK 5/7/08

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW07

ACZ Sample ID: ***L65087-02***
Date Sampled: *09/14/07 11:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:46	aml
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:00	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:04	jjr

Metals Analysis

Parameter	EPA Method		Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS		0.019			mg/L	0.001	0.005	09/25/07 10:37	jjr
Aluminum, total	M200.8 ICP-MS		0.049		*	mg/L	0.001	0.005	09/28/07 18:13	scp
Cadmium, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/25/07 10:37	jjr
Cadmium, total	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/21/07 12:41	scp
Calcium, dissolved	M200.7 ICP		21.9			mg/L	0.2	1	09/26/07 9:19	djt
Copper, dissolved	M200.8 ICP-MS		0.0081			mg/L	0.0005	0.003	09/25/07 10:37	jjr
Copper, total	M200.8 ICP-MS		0.0096			mg/L	0.0005	0.003	09/24/07 20:17	msh
Iron, dissolved	M200.7 ICP	J SQL-I	0.03	B		mg/L	0.02	0.05	09/26/07 9:19	djt
Iron, total	M200.7 ICP			U		mg/L	0.02	0.05	09/28/07 0:08	djt
Lead, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/25/07 10:37	jjr
Lead, total	M200.8 ICP-MS			U	*	mg/L	0.0001	0.0005	09/21/07 12:41	scp
Magnesium, dissolved	M200.7 ICP		10.3			mg/L	0.2	1	09/26/07 9:19	djt
Manganese, dissolved	M200.8 ICP-MS		0.0042			mg/L	0.0005	0.003	09/25/07 10:37	jjr
Manganese, total	M200.8 ICP-MS		0.0042			mg/L	0.0005	0.003	09/21/07 12:41	scp
Potassium, dissolved	M200.7 ICP		3.1			mg/L	0.3	2	09/26/07 9:19	djt
Sodium, dissolved	M200.7 ICP		13.0	U RB-I		mg/L	0.3	2	09/26/07 9:19	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW07

ACZ Sample ID: ***L65087-02***
Date Sampled: *09/14/07 11:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		101			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		101		*	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B J SQL-I	4	B	*	mg/L	1	5	09/21/07 2:07	jag
Carbon, total organic (TOC)	415.1 / SM5310B	5		*	mg/L	1	5	09/25/07 0:39	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		10.6			%			10/05/07 0:00	calc
Sum of Anions		2.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.6			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E EK 5/27/08 ~~J SQL-I~~ ~~3~~ 5		~~B~~	U RB-I	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	97			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:08	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) ~~J MS-H~~ EK 5/27/08 J MS-H EK 5/28/08	0.09		*	mg/L	0.01	0.05	10/03/07 14:24	aml
Sulfate	375.4 - Turbidimetric R-MS		~~U~~	~~*~~	~~mg/L~~	~~1~~	~~5~~	~~09/27/07 8:51~~	~~jlf~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: TB-1

ACZ Sample ID: ***L65087-03***
Date Sampled: *09/15/07 07:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:48	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:14	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:12	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	EK 5/27/08 ~~0.006~~ 0.006		U RB-I	mg/L	0.001	0.005	09/25/07 10:43	jjr
Aluminum, total	M200.8 ICP-MS	~~J SQL-I~~ J SQL-I	~~U FB-I~~ B		mg/L	0.001	0.005	10/02/07 10:09	jjr
Cadmium, dissolved	M200.8 ICP-MS	~~0.005~~ 0.001	U		mg/L	0.0001	0.0005	09/25/07 10:43	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 12:56	scp
Calcium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 9:32	djt
Copper, dissolved	M200.8 ICP-MS	J SQL-I 0.0007	B		mg/L	0.0005	0.003	09/25/07 10:43	jjr
Copper, total	M200.8 ICP-MS	J SQL-I 0.0012	B		mg/L	0.0005	0.003	09/24/07 20:33	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/26/07 9:32	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/28/07 0:12	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:43	jjr
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/24/07 20:33	msh
Magnesium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 9:32	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 10:43	jjr
Manganese, total	M200.8 ICP-MS	~~J SQL-I~~ ~~U FB-I~~ ~~0.0006~~ J SQL-I			mg/L	0.0005	0.003	09/21/07 12:56	scp
Potassium, dissolved	M200.7 ICP	~~0.003~~ 0.0006	U		mg/L	0.3	2	09/26/07 9:32	djt
Sodium, dissolved	M200.7 ICP		U		mg/L	0.3	2	09/26/07 9:32	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: TB-1

ACZ Sample ID: ***L65087-03***
Date Sampled: *09/15/07 07:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity			U	*	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/21/07 2:21	jag
Carbon, total organic (TOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/25/07 1:07	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		n/a			%			10/05/07 0:00	calc
Sum of Anions		N/A			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations			U		meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E		U	*	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:09	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	10/03/07 14:25	aml
Sulfate	375.4 - Turbidimetric R-MS	~~[illegible]~~	~~U~~	~~*~~	~~mg/L~~	~~1~~	~~5~~	~~09/27/07 9:01~~	~~jlf~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW09

ACZ Sample ID: ***L65087-04***
Date Sampled: *09/15/07 09:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:49	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:43	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:24	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.022			mg/L	0.001	0.005	09/25/07 10:49	jjr
Aluminum, total	M200.8 ICP-MS	0.027		*	mg/L	0.001	0.005	09/28/07 18:33	scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:49	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 13:01	scp
Calcium, dissolved	M200.7 ICP	27.3			mg/L	0.2	1	09/26/07 9:36	djt
Copper, dissolved	M200.8 ICP-MS	0.0110			mg/L	0.0005	0.003	09/25/07 10:49	jjr
Copper, total	M200.8 ICP-MS	0.0132			mg/L	0.0005	0.003	09/24/07 20:39	msh
Iron, dissolved	M200.7 ICP	0.08			mg/L	0.02	0.05	09/26/07 9:36	djt
Iron, total	M200.7 ICP	0.11			mg/L	0.02	0.05	09/28/07 0:16	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:49	jjr
Lead, total	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	09/21/07 13:01	scp
Magnesium, dissolved	M200.7 ICP	12.3			mg/L	0.2	1	09/26/07 9:36	djt
Manganese, dissolved	M200.8 ICP-MS	0.0328			mg/L	0.0005	0.003	09/25/07 10:49	jjr
Manganese, total	M200.8 ICP-MS	0.0278			mg/L	0.0005	0.003	09/21/07 13:01	scp
Potassium, dissolved	M200.7 ICP	3.2			mg/L	0.3	2	09/26/07 9:36	djt
Sodium, dissolved	M200.7 ICP	8.1	U RB-I		mg/L	0.3	2	09/26/07 9:36	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW09

ACZ Sample ID: ***L65087-04***
Date Sampled: *09/15/07 09:30*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration	EK 5/27/08							
Bicarbonate as CaCO3		~~J SQL-I~~ 20	~~B~~	U RB-I	mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3		EK 5/27/08	U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		~~J SQL-I~~ 20	~~B~~	U RB-I	mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	5		*	mg/L	1	5	09/21/07 2:35	jag
Carbon, total organic (TOC)	415.1 / SM5310B	6		*	mg/L	1	5	09/25/07 2:04	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		5.7			%			10/05/07 0:00	calc
Sum of Anions		2.5			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		EK 5/27/08 .8			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	~~J SQL-I~~ 5	~~B~~	U RB-I	mg/L	1	5	09/24/07 15:27	jlf
Hardness as CaCO3	SM2340B - Calculation	119			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:11	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	10/03/07 14:26	aml
Sulfate	375.4 - Turbidimetric J MS-L	112		*	mg/L	5	30	09/27/07 9:08	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW10

ACZ Sample ID: ***L65087-05***
Date Sampled: *09/15/07 11:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:55	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 14:52	jjr
Total Hot Plate Digestion	M200.2 ICP							09/24/07 19:36	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	~~0.007~~	0.007	U RB-I	mg/L	0.001	0.005	09/25/07 10:54	jjr
Aluminum, total	M200.8 ICP-MS	0.013			mg/L	0.001	0.005	10/02/07 10:26	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:54	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 13:16	scp
Calcium, dissolved	M200.7 ICP	17.6			mg/L	0.2	1	09/26/07 9:40	djt
Copper, dissolved	M200.8 ICP-MS	~~J SQL-I~~ ~~0.0026~~ 0.003		~~B~~ U FB-I	mg/L	0.0005	0.003	09/25/07 10:54	jjr
Copper, total	M200.8 ICP-MS	0.0030			mg/L	0.0005	0.003	09/24/07 20:45	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/26/07 9:40	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/28/07 0:21	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 10:54	jjr
Lead, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/24/07 20:45	msh
Magnesium, dissolved	M200.7 ICP	7.4			mg/L	0.2	1	09/26/07 9:40	djt
Manganese, dissolved	M200.8 ICP-MS	0.0077			mg/L	0.0005	0.003	09/25/07 10:54	jjr
Manganese, total	M200.8 ICP-MS	0.0066			mg/L	0.0005	0.003	09/21/07 13:16	scp
Potassium, dissolved	M200.7 ICP	2.8			mg/L	0.3	2	09/26/07 9:40	djt
Sodium, dissolved	M200.7 ICP	7.5	U RB-I		mg/L	0.3	2	09/26/07 9:40	djt

EK 5/7/08

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW10

ACZ Sample ID: ***L65087-05***
Date Sampled: *09/15/07 11:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		23			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		23			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	J SQL-I 3	B	*	mg/L	1	5	09/21/07 2:49	jag
Carbon, total organic (TOC)	415.1 / SM5310B	J SQL-I 3	B	*	mg/L	1	5	09/25/07 2:18	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		9.1			%			10/05/07 0:00	calc
Sum of Anions		1.5			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	EK 5/27/08 ~~J SQL-I~~ 25	~~B~~	URB-I	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	74			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:14	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest)		U	*	mg/L	0.01	0.05	10/03/07 14:29	aml
Sulfate	375.4 - Turbidimetric J MS-L	51		*	mg/L	5	30	09/27/07 9:08	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting

Project ID: OG01XB EK 5/7/08

Sample ID: BDAW-4

ACZ Sample ID: ***L65088-01***

Date Sampled: *09/13/07 10:15*

Date Received: *09/18/07*

Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:57	aml
Total Hot Plate Digestion	M200.2 ICP							09/26/07 11:34	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 8:12	jjr

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.048			mg/L	0.005	0.03	09/25/07 11:12	jjr
Aluminum, total	M200.8 ICP-MS	0.428		*	mg/L	0.001	0.005	09/24/07 20:50	msh
Cadmium, dissolved	M200.8 ICP-MS J SQL-I	0.0006	B		mg/L	0.0005	0.003	09/25/07 11:12	jjr
Cadmium, total	M200.8 ICP-MS ↓	0.0006	B		mg/L	0.0002	0.001	09/21/07 13:21	scp
Calcium, dissolved	M200.7 ICP	18.5			mg/L	0.2	1	09/26/07 9:44	djt
Copper, dissolved	M200.8 ICP-MS	0.080			mg/L	0.003	0.01	09/25/07 11:12	jjr
Copper, total	M200.8 ICP-MS	0.0943			mg/L	0.0005	0.003	09/24/07 20:50	msh
Iron, dissolved	M200.7 ICP	0.14			mg/L	0.02	0.05	09/26/07 9:44	djt
Iron, total	M200.7 ICP	0.48			mg/L	0.02	0.05	09/27/07 20:45	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:12	jjr
Lead, total	M200.8 ICP-MS J SQL-I	0.0003	B		mg/L	0.0001	0.0005	09/24/07 20:50	msh
Magnesium, dissolved	M200.7 ICP	5.7			mg/L	0.2	1	09/26/07 9:44	djt
Manganese, dissolved	M200.8 ICP-MS	0.213			mg/L	0.003	0.01	09/25/07 11:12	jjr
Manganese, total	M200.8 ICP-MS	0.200			mg/L	0.001	0.005	09/21/07 13:21	scp
Potassium, dissolved	M200.7 ICP	3.6			mg/L	0.3	2	09/26/07 9:44	djt
Sodium, dissolved	M200.7 ICP	13.9	U RB-I		mg/L	0.3	2	09/26/07 9:44	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting

Project ID: OG01XB EK 5/7/08

Sample ID: BD~~A~~W-4

ACZ Sample ID: ***L65088-01***

Date Sampled: *09/13/07 10:15*

Date Received: *09/18/07*

Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		31			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		31			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B J SQL-I	3	B	*	mg/L	1	5	09/21/07 3:04	jag
Carbon, total organic (TOC)	415.1 / SM5310B J SQL-I	3	B	*	mg/L	1	5	09/25/07 2:33	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		13.5			%			10/05/07 0:00	calc
Sum of Anions		1.6			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.1			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E ~~J SQL-I~~ EK 5/27/08 ~~85~~		B	U RB-I	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	70			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:15	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) ~~J-M~~	0.04	B	*	mg/L	0.01	0.05	10/03/07 14:30	aml
Sulfate	375.4 - Turbidimetric J MS-L	46		*	mg/L	5	30	09/27/07 9:08	jlf

J MS, W SQL-~~I~~ H ~~EK 5/27/08~~ EK 5/28/08

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW313

ACZ Sample ID: ***L65088-02***
Date Sampled: *09/13/07 10:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 11:59	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 8:45	jjr
Total Hot Plate Digestion	M200.2 ICP							09/26/07 12:09	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.049			mg/L	0.005	0.03	09/25/07 11:17	jjr
Aluminum, total	M200.8 ICP-MS	0.223	J FD-I	*	mg/L	0.001	0.005	09/24/07 20:56	msh
Cadmium, dissolved	M200.8 ICP-MS J SQL-I	0.0006	B		mg/L	0.0005	0.003	09/25/07 11:17	jjr
Cadmium, total	M200.8 ICP-MS ↓	0.0006	B		mg/L	0.0002	0.001	09/21/07 13:25	scp
Calcium, dissolved	M200.7 ICP	19.2			mg/L	0.2	1	09/26/07 9:48	djt
Copper, dissolved	M200.8 ICP-MS	0.071			mg/L	0.003	0.01	09/25/07 11:17	jjr
Copper, total	M200.8 ICP-MS	0.0942			mg/L	0.0005	0.003	09/24/07 20:56	msh
Iron, dissolved	M200.7 ICP	0.14			mg/L	0.02	0.05	09/26/07 9:48	djt
Iron, total	M200.7 ICP	0.56	J FD-I		mg/L	0.02	0.05	09/27/07 21:06	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:17	jjr
Lead, total	M200.8 ICP-MS J SQL-I	0.0003	B		mg/L	0.0001	0.0005	09/24/07 20:56	msh
Magnesium, dissolved	M200.7 ICP	6.0	J FD-I		mg/L	0.2	1	09/26/07 9:48	djt
Manganese, dissolved	M200.8 ICP-MS	0.216			mg/L	0.003	0.01	09/25/07 11:17	jjr
Manganese, total	M200.8 ICP-MS	0.204			mg/L	0.001	0.005	09/21/07 13:25	scp
Potassium, dissolved	M200.7 ICP	3.7	~~J FD-I~~ EK 5/23/08		mg/L	0.3	2	09/26/07 9:48	djt
Sodium, dissolved	M200.7 ICP	14.5	~~J FD-I~~ EK 5/27/08		mg/L	0.3	2	09/26/07 9:48	djt

UJ RB, FD-I

EK 5/7/08

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW313

ACZ Sample ID: ***L65088-02***
Date Sampled: *09/13/07 10:45*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		32			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		32			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B J SQL-I	4	B	*	mg/L	1	5	09/21/07 3:18	jag
Carbon, total organic (TOC)	415.1 / SM5310B J SQL-I	4	B	*	mg/L	1	5	09/25/07 2:47	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		15.8			%			10/05/07 0:00	calc
Sum of Anions		1.6			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		2.2			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E EK 5/27/08 ~~J SQL-I~~	~~8~~ 5	~~B~~	U RB-I	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	73			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved EK 5/13/08	0		*	mg/L	0.02	0.1	09/28/07 21:16	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) ~~J SQL-I~~ J MS, SQL, FD-H	0.03	B	*	mg/L	0.01	0.05	10/03/07 14:31	aml
Sulfate	375.4 - Turbidimetric J MS-L	45	~~J FD-I~~ EK 5/23/08	*	mg/L	5	30	09/27/07 9:08	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW15

ACZ Sample ID: ***L65088-03***
Date Sampled: *09/13/07 12:15*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 12:00	aml
Total Hot Plate Digestion	M200.2 ICP							09/26/07 12:21	nek/wfg
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 9:19	jjr

Metals Analysis

Parameter	EPA Method		Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS		0.307			mg/L	0.001	0.005	09/25/07 11:23	jjr
Aluminum, total	M200.8 ICP-MS		4.220		*	mg/L	0.001	0.005	09/24/07 21:02	msh
Cadmium, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	09/25/07 11:23	jjr
Cadmium, total	M200.8 ICP-MS			U		mg/L	0.001	0.005	09/21/07 13:30	scp
Calcium, dissolved	M200.7 ICP		14.8			mg/L	0.2	1	09/26/07 9:53	djt
Copper, dissolved	M200.8 ICP-MS		0.0522			mg/L	0.0005	0.003	09/25/07 11:23	jjr
Copper, total	M200.8 ICP-MS		0.1100			mg/L	0.0005	0.003	09/24/07 21:02	msh
Iron, dissolved	M200.7 ICP		0.17			mg/L	0.02	0.05	09/26/07 9:53	djt
Iron, total	M200.7 ICP		2.76			mg/L	0.02	0.05	09/27/07 21:10	djt
Lead, dissolved	M200.8 ICP-MS	J SQL-I	0.0002	B		mg/L	0.0001	0.0005	09/25/07 11:23	jjr
Lead, total	M200.8 ICP-MS		0.0028			mg/L	0.0001	0.0005	09/24/07 21:02	msh
Magnesium, dissolved	M200.7 ICP		4.9			mg/L	0.2	1	09/26/07 9:53	djt
Manganese, dissolved	M200.8 ICP-MS	J SQL-I	0.0027	B		mg/L	0.0005	0.003	09/25/07 11:23	jjr
Manganese, total	M200.8 ICP-MS		0.089			mg/L	0.005	0.03	09/21/07 13:30	scp
Potassium, dissolved	M200.7 ICP		6.3			mg/L	0.3	2	09/26/07 9:53	djt
Sodium, dissolved	M200.7 ICP		3.5	U RB-I		mg/L	0.3	2	09/26/07 9:53	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW15

ACZ Sample ID: ***L65088-03***
Date Sampled: *09/13/07 12:15*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		33			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		33			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/21/07 3:32	jag
Carbon, total organic (TOC)	415.1 / SM5310B	8		*	mg/L	1	5	09/25/07 3:01	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		36.4			%			10/05/07 0:00	calc
Sum of Anions		0.7			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		1.5			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E EK 5/27/08 ~~J SQL-I~~	~~2~~ 5	~~B~~	U*RB-I	mg/L	1	5	09/24/07 15:28	jlf
Hardness as CaCO3	SM2340B - Calculation	57			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:21	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J MS-H EK 5/28/08	0.09	~~J MS-H~~ ~~EK 5/27/08~~	*	mg/L	0.01	0.05	10/03/07 14:32	aml
Sulfate	375.4 - Turbidimetric R-MS		U	*	mg/L	1	5	09/27/07 9:01	jlf

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW04

ACZ Sample ID: ***L65088-04***
Date Sampled: *09/13/07 16:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 12:02	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/19/07 9:52	jjr
Total Hot Plate Digestion	M200.2 ICP			*				09/26/07 12:33	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.106			mg/L	0.001	0.005	09/25/07 11:40	jjr
Aluminum, total	M200.8 ICP-MS	6.800		*	mg/L	0.001	0.005	09/24/07 21:18	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 11:40	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.001	0.005	09/21/07 13:35	scp
Calcium, dissolved	M200.7 ICP	29.4			mg/L	0.2	1	09/26/07 9:57	djt
Copper, dissolved	M200.8 ICP-MS	0.1290			mg/L	0.0005	0.003	09/25/07 11:40	jjr
Copper, total	M200.8 ICP-MS	0.6900			mg/L	0.0005	0.003	09/24/07 21:18	msh
Iron, dissolved	M200.7 ICP	0.07			mg/L	0.02	0.05	09/26/07 9:57	djt
Iron, total	M200.7 ICP	5.23			mg/L	0.04	0.1	09/27/07 21:14	djt
Lead, dissolved	M200.8 ICP-MS J SQL-I	0.0002	B		mg/L	0.0001	0.0005	09/25/07 11:40	jjr
Lead, total	M200.8 ICP-MS	0.0096			mg/L	0.0001	0.0005	09/24/07 21:18	msh
Magnesium, dissolved	M200.7 ICP	2.2			mg/L	0.2	1	09/26/07 9:57	djt
Manganese, dissolved	M200.8 ICP-MS J SQL-I	0.0024	B		mg/L	0.0005	0.003	09/25/07 11:40	jjr
Manganese, total	M200.8 ICP-MS	0.100			mg/L	0.005	0.03	09/21/07 13:35	scp
Potassium, dissolved	M200.7 ICP	9.2			mg/L	0.3	2	09/26/07 9:57	djt
Sodium, dissolved	M200.7 ICP ~~J SQL-I~~ EK 5/27/08	~~0.9~~ 2	~~B~~	U RB-I	mg/L	0.3	2	09/26/07 9:57	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: SW04

ACZ Sample ID: ***L65088-04***
Date Sampled: *09/13/07 16:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		86			mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3	J SQL-I	3	B		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		89			mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B	9		*	mg/L	1	5	09/27/07 20:46	scp
Carbon, total organic (TOC)	415.1 / SM5310B J SQL-I	9	B	*	mg/L	2	10	09/25/07 3:15	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		2.7			%			10/05/07 0:00	calc
Sum of Anions		1.8			meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		EK 5/27/08 1.9			meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	~~J SQL-I~~ ~~2~~ 5	~~B~~	U RB-I	mg/L	1	5	09/24/07 15:42	jlf
Hardness as CaCO3	SM2340B - Calculation	83			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:22	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) J MS-H EK 5/28/08	0.49	~~J MS-H~~ ~~EK 5/27/08~~	*	mg/L	0.02	0.1	10/03/07 14:51	aml
Sulfate	375.4 - Turbidimetric R-MS		U	*	~~mg/L~~	~~1~~	~~5~~	~~09/27/07 9:01~~	~~jlf~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: ER-1

ACZ Sample ID: ***L65088-05***
Date Sampled: *09/13/07 17:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Inorganic Prep

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Phosphorus, total	M365.1 - Auto Ascorbic Acid Digestion							10/01/07 12:06	aml
Total Hot Plate Digestion	M200.2 ICP-MS							09/27/07 15:02	jjr
Total Hot Plate Digestion	M200.2 ICP							09/26/07 12:44	nek/wfg

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS J SQL-I	0.002	B		mg/L	0.001	0.005	09/25/07 11:46	jjr
Aluminum, total	M200.8 ICP-MS ~~J~~	0.00~~4~~5	~~B~~	UFB-I	mg/L	0.001	0.005	10/02/07 10:31	jjr
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/25/07 11:46	jjr
Cadmium, total	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	09/21/07 13:40	scp
Calcium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 10:01	djt
Copper, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:46	jjr
Copper, total	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/24/07 21:24	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	09/26/07 10:01	djt
Iron, total	M200.7 ICP		U		mg/L	0.02	0.05	09/27/07 21:18	djt
Lead, dissolved	M200.8 ICP-MS J SQL-I	3	U		mg/L	0.0001	0.0005	09/25/07 11:46	jjr
Lead, total	M200.8 ICP-MS ~~J SQL-I~~	0.000~~2~~3	~~B~~	~~UFB-I~~	mg/L	0.0001	0.0005	09/24/07 21:24	msh
Magnesium, dissolved	M200.7 ICP		U		mg/L	0.2	1	09/26/07 10:01	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/25/07 11:46	jjr
Manganese, total	M200.8 ICP-MS		U		mg/L	0.0005	0.003	09/21/07 13:40	scp
Potassium, dissolved	M200.7 ICP		U		mg/L	0.3	2	09/26/07 10:01	djt
Sodium, dissolved	M200.7 ICP	3.4			mg/L	0.3	2	09/26/07 10:01	djt

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

SRK Consulting
Project ID: OG01XB
Sample ID: ER-1

ACZ Sample ID: ***L65088-05***
Date Sampled: *09/13/07 17:00*
Date Received: *09/18/07*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration								
Bicarbonate as CaCO3		J SQL-I 3	B		mg/L	2	20	09/24/07 0:00	lcp
Carbonate as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Hydroxide as CaCO3			U		mg/L	2	20	09/24/07 0:00	lcp
Total Alkalinity		J SQL-I 3	B		mg/L	2	20	09/24/07 0:00	lcp
Carbon, dissolved organic (DOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/27/07 21:14	scp
Carbon, total organic (TOC)	415.1 / SM5310B		U	*	mg/L	1	5	09/25/07 3:29	jag
Cation-Anion Balance	Calculation								
Cation-Anion Balance		n/a			%			10/05/07 0:00	calc
Sum of Anions		J SQL-I 0.1	B		meq/L	0.1	0.5	10/05/07 0:00	calc
Sum of Cations		0.1	B		meq/L	0.1	0.5	10/05/07 0:00	calc
Chloride	325.2 / SM4500Cl-E	3	B	*	mg/L	1	5	09/24/07 15:42	jlf
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	10/05/07 0:00	calc
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved		U	*	mg/L	0.02	0.1	09/28/07 21:24	pjb
Phosphorus, total	M365.1 - Auto Ascorbic Acid (digest) ~~UJ MS II~~ EK 5/12/08		U	*	mg/L	0.01	0.05	10/03/07 14:36	aml
Sulfate	375.4 - Turbidimetric R-MS		~~U~~	~~*~~	~~mg/L~~	~~1~~	~~5~~	~~09/27/07 9:01~~	~~jlf~~

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-03-U

ACZ Sample ID: ***L66007-01***
Date Sampled: *10/29/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.005			mg/L	0.001	0.005	11/07/07 5:04	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:29	msh
Calcium, dissolved	M200.7 ICP	24.3			mg/L	0.2	1	11/08/07 0:26	wfg
Copper, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:29	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:26	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:29	msh
Magnesium, dissolved	M200.7 ICP	7.0 ~~J FD~~ EK 5/23/09			mg/L	0.2	1	11/08/07 0:26	wfg
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	11/07/07 5:04	jjr

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	90			mg/L	1	7	11/21/07 13:46	calc

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-02-U

ACZ Sample ID: ***L66007-02***
Date Sampled: *10/25/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS J SQL-I	0.003	B		mg/L	0.001	0.005	11/07/07 5:20	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:34	msh
Calcium, dissolved	M200.7 ICP	15.3			mg/L	0.2	1	11/08/07 0:30	wfg
Copper, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:34	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:30	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:34	msh
Magnesium, dissolved	M200.7 ICP	4.7			mg/L	0.2	1	11/08/07 0:30	wfg
Manganese, dissolved	M200.8 ICP-MS	0.0055			mg/L	0.0005	0.003	11/07/07 5:20	jjr

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	58			mg/L	1	7	11/21/07 13:46	calc

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-08-U

ACZ Sample ID: ***L66007-03***
Date Sampled: *10/11/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS J SQL-I	0.003	B		mg/L	0.001	0.005	11/07/07 5:26	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:40	msh
Calcium, dissolved	M200.7 ICP	23.2			mg/L	0.2	1	11/08/07 0:34	wfg
Copper, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:40	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:34	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:40	msh
Magnesium, dissolved	M200.7 ICP	11.0			mg/L	0.2	1	11/08/07 0:34	wfg
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	11/07/07 5:26	jjr

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	103			mg/L	1	7	11/21/07 13:47	calc

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-12-U

ACZ Sample ID: ***L66007-04***
Date Sampled: *10/16/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS J SQL-I	0.004	B		mg/L	0.001	0.005	11/07/07 5:31	jjr
Cadmium, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:46	msh
Calcium, dissolved	M200.7 ICP	17.0			mg/L	0.2	1	11/08/07 0:38	wfg
Copper, dissolved	M200.8 ICP-MS	0.0046			mg/L	0.0005	0.003	11/07/07 5:31	jjr
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	11/08/07 0:38	wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	11/05/07 15:46	msh
Magnesium, dissolved	M200.7 ICP	1.8			mg/L	0.2	1	11/08/07 0:38	wfg
Manganese, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0005	0.003	11/05/07 15:46	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	50			mg/L	1	7	11/21/07 13:47	calc

EK 5/7/08

** Please refer to Qualifier Reports for details.*

ACZ Laboratories, Inc.

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG10XB
Sample ID: SW-01-U

ACZ Sample ID: ***L66007-05***
Date Sampled: *10/18/07 00:00*
Date Received: *10/31/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method		Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS			U	*	mg/L	0.001	0.005	11/05/07 15:51	msh
Cadmium, dissolved	M200.8 ICP-MS			U	*	mg/L	0.0001	0.0005	11/05/07 15:51	msh
Calcium, dissolved	M200.7 ICP	EK 5/27/08	9.0			mg/L	0.2	1	11/08/07 0:50	wfg
Copper, dissolved	M200.8 ICP-MS	~~J SQL-I~~	~~0.0013~~	~~B~~ U FB-I		mg/L	0.0005	0.003	11/09/07 10:35	msh
Iron, dissolved	M200.7 ICP		0.003	U		mg/L	0.02	0.05	11/08/07 0:50	wfg
Lead, dissolved	M200.8 ICP-MS			U	*	mg/L	0.0001	0.0005	11/05/07 15:51	msh
Magnesium, dissolved	M200.7 ICP		3.8			mg/L	0.2	1	11/08/07 0:50	wfg
Manganese, dissolved	M200.8 ICP-MS	J SQL-I	0.0025	B		mg/L	0.0005	0.003	11/09/07 10:35	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	38			mg/L	1	7	11/21/07 13:47	calc

EK 5/7/08

** Please refer to Qualifier Reports for details.*

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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-04-U

ACZ Sample ID: ***L66467-01***
Date Sampled: *11/08/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.005			mg/L	0.001	0.005	11/29/07 14:02	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:02	msh
Calcium, dissolved	M200.7 ICP	27.0			mg/L	0.2	1	12/05/07 3:39	djt
Copper, dissolved	M200.8 ICP-MS	0.0201			mg/L	0.0005	0.003	11/29/07 14:02	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/05/07 3:39	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:02	msh
Magnesium, dissolved	M200.7 ICP	2.1			mg/L	0.2	1	12/05/07 3:39	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	11/29/07 14:02	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	76			mg/L	1	7	12/11/07 15:30	calc

EK 5/7/08

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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-05-U

ACZ Sample ID: ***L66467-02***
Date Sampled: *11/08/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	10.00			mg/L	0.05	0.3	11/30/07 23:59	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0039			mg/L	0.0001	0.0005	11/29/07 14:08	msh
Calcium, dissolved	M200.7 ICP	69.9			mg/L	0.2	1	12/05/07 3:43	djt
Copper, dissolved	M200.8 ICP-MS	1.14			mg/L	0.03	0.1	11/30/07 23:59	msh
Iron, dissolved	M200.7 ICP	0.09			mg/L	0.02	0.05	12/05/07 3:43	djt
Lead, dissolved	M200.8 ICP-MS J SQL-I	0.0004	B		mg/L	0.0001	0.0005	11/29/07 14:08	msh
Magnesium, dissolved	M200.7 ICP	47.0			mg/L	0.2	1	12/05/07 3:43	djt
Manganese, dissolved	M200.8 ICP-MS	4.28			mg/L	0.03	0.1	11/30/07 23:59	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	368			mg/L	1	7	12/11/07 15:30	calc

EK 5/7/08

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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-09-U

ACZ Sample ID: ***L66467-03***
Date Sampled: *11/11/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.013			mg/L	0.001	0.005	11/29/07 14:14	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:14	msh
Calcium, dissolved	M200.7 ICP	24.8			mg/L	0.2	1	12/05/07 3:48	djt
Copper, dissolved	M200.8 ICP-MS	~~0.0020~~ 0.003	~~B~~ U	FB-I	mg/L	0.0005	0.003	11/29/07 14:14	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/05/07 3:48	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:14	msh
Magnesium, dissolved	M200.7 ICP	11.3			mg/L	0.2	1	12/05/07 3:48	djt
Manganese, dissolved	M200.8 ICP-MS	0.0287			mg/L	0.0005	0.003	11/29/07 14:14	msh

EK 5/27/08 ~~J SQL-I~~

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	108			mg/L	1	7	12/11/07 15:30	calc

EK 5/7/08

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Inorganic Analytical Results

Phelps Dodge Mining Company
Project ID: OG01XB
Sample ID: SW-10-U

ACZ Sample ID: ***L66467-04***
Date Sampled: *11/15/07 00:00*
Date Received: *11/27/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.009			mg/L	0.001	0.005	11/29/07 14:25	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:25	msh
Calcium, dissolved	M200.7 ICP	15.4			mg/L	0.2	1	12/05/07 3:52	djt
Copper, dissolved	M200.8 ICP-MS ~~J SQL-I~~ EK 5/27/08	~~0.0009~~ 0.003	~~B~~ U FB-I		mg/L	0.0005	0.003	11/29/07 14:25	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/05/07 3:52	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	11/29/07 14:25	msh
Magnesium, dissolved	M200.7 ICP	6.6			mg/L	0.2	1	12/05/07 3:52	djt
Manganese, dissolved	M200.8 ICP-MS J SQL-I	0.0013	B		mg/L	0.0005	0.003	11/29/07 14:25	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	66			mg/L	1	7	12/11/07 15:30	calc

EK 5/7/08

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW312-U

ACZ Sample ID: ***L66778-01***
Date Sampled: *11/29/07 12:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.007			mg/L	0.001	0.005	12/17/07 23:22	gme/scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/17/07 23:22	gme/scp
Calcium, dissolved	M200.7 ICP	17.1			mg/L	0.2	1	12/20/07 3:01	djt
Copper, dissolved	M200.8 ICP-MS	0.0148			mg/L	0.0005	0.003	12/19/07 12:42	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:01	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 12:42	gme/scp
Magnesium, dissolved	M200.7 ICP	1.9 ~~J FD I~~			mg/L	0.2	1	12/20/07 3:01	djt
Manganese, dissolved	M200.8 ICP-MS J SQL-I	0.0006	B EK 5/23/08		mg/L	0.0005	0.003	12/17/07 23:22	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	51			mg/L	1	7	12/27/07 15:00	calc

EK 5/7/08

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: TB-1-U

ACZ Sample ID: ***L66778-02***
Date Sampled: *12/02/07 00:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method		Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	J SQL-I	0.002	B		mg/L	0.001	0.005	12/17/07 23:39	gme/scp
Cadmium, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	12/17/07 23:39	gme/scp
Calcium, dissolved	M200.7 ICP			U		mg/L	0.2	1	12/20/07 3:14	djt
Copper, dissolved	M200.8 ICP-MS			U		mg/L	0.0005	0.003	12/19/07 12:48	gme/scp
Iron, dissolved	M200.7 ICP			U		mg/L	0.02	0.05	12/20/07 3:14	djt
Lead, dissolved	M200.8 ICP-MS			U		mg/L	0.0001	0.0005	12/19/07 12:48	gme/scp
Magnesium, dissolved	M200.7 ICP			U		mg/L	0.2	1	12/20/07 3:14	djt
Manganese, dissolved	M200.8 ICP-MS			U		mg/L	0.0005	0.003	12/17/07 23:39	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	12/27/07 15:00	calc

EK 5/7/08

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW11-U

ACZ Sample ID: ***L66778-03***
Date Sampled: *12/07/07 00:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.009			mg/L	0.001	0.005	12/17/07 23:45	gme/scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/17/07 23:45	gme/scp
Calcium, dissolved	M200.7 ICP	12.7			mg/L	0.2	1	12/20/07 3:26	djt
Copper, dissolved	M200.8 ICP-MS	0.0073			mg/L	0.0005	0.003	12/19/07 12:54	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:26	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 12:54	gme/scp
Magnesium, dissolved	M200.7 ICP	1.7			mg/L	0.2	1	12/20/07 3:26	djt
Manganese, dissolved	M200.8 ICP-MS J SQL-I	0.0015	B		mg/L	0.0005	0.003	12/17/07 23:45	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	39			mg/L	1	7	12/27/07 15:00	calc

EK 5/7/08

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW14-U

ACZ Sample ID: ***L66778-04***
Date Sampled: *12/13/07 12:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS J SQL-I	0.003	B		mg/L	0.001	0.005	12/17/07 23:51	gme/scp
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/17/07 23:51	gme/scp
Calcium, dissolved	M200.7 ICP	6.4			mg/L	0.2	1	12/20/07 3:30	djt
Copper, dissolved	M200.8 ICP-MS	0.0097			mg/L	0.0005	0.003	12/19/07 13:10	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:30	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 13:10	gme/scp
Magnesium, dissolved	M200.7 ICP	1.8			mg/L	0.2	1	12/20/07 3:30	djt
Manganese, dissolved	M200.8 ICP-MS J SQL-I	0.0014	B		mg/L	0.0005	0.003	12/17/07 23:51	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	23			mg/L	1	7	12/27/07 15:00	calc

EK 5/7/08

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG10XB
Sample ID: SW15-U

ACZ Sample ID: ***L66778-05***
Date Sampled: *12/10/07 09:00*
Date Received: *12/14/07*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS J SQL-I	0.002	B		mg/L	0.001	0.005	12/17/07 23:57	gme/scp
Cadmium, dissolved	M200.8 ICP-MS ↓	0.0004	B		mg/L	0.0001	0.0005	12/17/07 23:57	gme/scp
Calcium, dissolved	M200.7 ICP	12.7			mg/L	0.2	1	12/20/07 3:34	djt
Copper, dissolved	M200.8 ICP-MS	0.0094			mg/L	0.0005	0.003	12/19/07 13:16	gme/scp
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	12/20/07 3:34	djt
Lead, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	12/19/07 13:16	gme/scp
Magnesium, dissolved	M200.7 ICP	4.2			mg/L	0.2	1	12/20/07 3:34	djt
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	12/17/07 23:57	gme/scp

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	49			mg/L	1	7	12/27/07 15:00	calc

EK 5/7/08

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: ER-1-U

ACZ Sample ID: ***L67712-02***
Date Sampled: *02/14/08 00:00*
Date Received: *02/16/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.042			mg/L	0.001	0.005	02/20/08 22:44	msh
Cadmium, dissolved	M200.8 ICP-MS		U		mg/L	0.0001	0.0005	02/20/08 22:44	msh
Calcium, dissolved	M200.7 ICP		U	*	mg/L	0.2	1	02/20/08 1:44	aeh/wfg
Copper, dissolved	M200.8 ICP-MS	U CCB, EB ~~0.0021~~ 0.003	B		mg/L	0.0005	0.003	02/20/08 22:44	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	02/20/08 1:44	aeh/wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	02/20/08 22:44	msh
Magnesium, dissolved	M200.7 ICP		U	*	mg/L	0.2	1	02/20/08 1:44	aeh/wfg
Manganese, dissolved	M200.8 ICP-MS		U		mg/L	0.0005	0.003	02/20/08 22:44	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	n/a			mg/L	1	7	02/29/08 13:27	calc

EK 5/7/08

REPIN.02.06.05.01

** Please refer to Qualifier Reports for details.*

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Inorganic Analytical Results

Freeport-McMoRan - Chino Mines Company
Project ID: OG01XB
Sample ID: CDW-1-U

ACZ Sample ID: ***L67712-01***
Date Sampled: *02/12/08 00:00*
Date Received: *02/16/08*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.8 ICP-MS	0.025			mg/L	0.001	0.005	02/20/08 22:39	msh
Cadmium, dissolved	M200.8 ICP-MS	0.0009	U CCB-I		mg/L	0.0001	~~0.0005~~ 0.0009	02/20/08 22:39	msh
Calcium, dissolved	M200.7 ICP	7.8		*	mg/L	0.2	1	02/20/08 1:40	aeh/wfg
Copper, dissolved	M200.8 ICP-MS	0.1240			mg/L	0.0005	0.003	02/20/08 22:39	msh
Iron, dissolved	M200.7 ICP		U		mg/L	0.02	0.05	02/20/08 1:40	aeh/wfg
Lead, dissolved	M200.8 ICP-MS		U	*	mg/L	0.0001	0.0005	02/20/08 22:39	msh
Magnesium, dissolved	M200.7 ICP	2.0		*	mg/L	0.2	1	02/20/08 1:40	aeh/wfg
Manganese, dissolved	M200.8 ICP-MS	0.0365			mg/L	0.0005	0.003	02/20/08 22:39	msh

Wet Chemistry

Parameter	EPA Method	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Hardness as CaCO3	SM2340B - Calculation	28			mg/L	1	7	02/29/08 13:27	calc

EK 5/7/08

** Please refer to Qualifier Reports for details.*

APPENDIX D

Discriminant Function Model Runs

OUTPUT FOR MODEL 1

Backward stepwise with Alpha-to-Enter=0.150 and Alpha-to-Remove=0.150

Group frequencies

1	2	3	4
14	10	9	10

Group means

	1	2	3	4
AS	1.744	2.056	5.376	4.140
BA	130.279	101.510	202.556	182.900
BE	0.651	0.567	0.648	0.793
CA	3942.143	9176.700	3577.778	16445.000
CR	30.850	17.010	7.733	14.270
CO	13.014	8.950	8.111	10.920
CU	211.179	492.000	2795.333	4673.000
FE	22726.429	25460.000	18063.333	18860.000
PB	34.629	17.380	61.567	72.440
MG	3508.571	2234.000	2303.333	2976.000
MN	525.786	279.800	229.222	385.800
MO	3.993	8.520	40.322	15.130
NI	20.414	9.770	11.411	16.180
K	1782.143	1890.000	1941.111	2799.000
NA	177.714	66.190	174.067	79.960
V	61.750	35.260	17.522	26.930
PH	6.459	5.865	5.009	7.718

Between groups F-matrix -- df = 17 23

	1	2	3	4
1	0.000			
2	4.129	0.000		
3	7.358	9.217	0.000	
4	14.691	14.288	8.188	0.000

Wilks' lambda

Lambda = 0.0031 df = 17 3 39

Approx. F= 8.0906 df = 51 69 prob = 0.0000

Classification functions

	1	2	3	4
CONSTANT	-121.527	-108.658	-132.353	-167.053
AS	-9.717	-9.838	-9.886	-6.370
BA	0.137	0.194	0.158	0.117
BE	143.997	143.014	132.207	114.690
CA	-0.002	-0.001	-0.002	-0.002
CR	0.143	-0.192	0.786	0.995
CO	-2.583	-3.422	-2.232	-5.000
CU	-0.003	-0.003	0.003	0.014
FE	0.001	0.002	0.001	0.001
PB	0.111	0.093	0.111	0.036
MG	-0.012	-0.015	-0.013	-0.016
MN	-0.045	-0.068	-0.060	-0.027
MO	1.636	1.250	1.708	0.898
NI	-0.682	-0.683	-0.415	-0.272
K	-0.010	-0.007	-0.008	-0.006
NA	0.045	0.004	0.159	0.126
V	0.713	0.920	-0.058	0.128
PH	31.617	28.742	31.015	36.327

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
5 AS	0.41	0.131354			
6 BA	0.51	0.226371			
7 BE	0.40	0.265573			
10 CA	1.53	0.329149			
11 CR	1.54	0.023944			
12 CO	0.62	0.018769			
13 CU	12.32	0.279309			
14 FE	1.92	0.053124			
15 PB	0.58	0.342314			
16 MG	0.67	0.083195			
17 MN	0.57	0.134367			
19 MO	1.80	0.114852			
20 NI	0.41	0.149687			
21 K	0.29	0.341749			
24 NA	4.43	0.104284			
26 V	2.33	0.012451			
28 PH	1.28	0.165593			

Between groups F-matrix -- df = 16 24

	1	2	3	4
1	0.000			
2	4.421	0.000		
3	8.053	10.216	0.000	
4	16.042	15.833	9.057	0.000

Wilks' lambda
Lambda = 0.0032 df = 16 3 39
Approx. F= 8.8618 df = 48 72 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
5 AS	0.47	0.148574	21 K	0.29	0.341749
6 BA	0.51	0.226744			

7	BE	0.39	0.332847
10	CA	1.55	0.333460
11	CR	1.74	0.024956
12	CO	0.81	0.019559
13	CU	15.81	0.288149
14	FE	2.67	0.055530
15	PB	0.56	0.348592
16	MG	0.53	0.093039
17	MN	0.62	0.134457
19	MO	1.74	0.122477
20	NI	0.42	0.149925
24	NA	4.62	0.104422
26	V	2.52	0.012574
28	PH	1.38	0.180763

Between groups F-matrix -- df = 15 25

	1	2	3	4
1	0.000			
2	4.882	0.000		
3	8.883	11.196	0.000	
4	17.131	16.724	9.800	0.000

Wilks' lambda
Lambda = 0.0033 df = 15 3 39
Approx. F= 9.6907 df = 45 75 prob = 0.0000

Variable		F-to-remove	Tolerance
5	AS	0.30	0.184164
6	BA	0.43	0.250917
10	CA	1.63	0.333656
11	CR	1.54	0.026816
12	CO	0.80	0.019701
13	CU	18.62	0.367663
14	FE	2.78	0.055729
15	PB	0.44	0.418877
16	MG	1.11	0.123159
17	MN	0.51	0.159179
19	MO	1.78	0.135597
20	NI	0.39	0.151159
24	NA	4.80	0.104636
26	V	2.54	0.014104
28	PH	2.42	0.198519

Variable		F-to-enter	Tolerance
7	BE	0.39	0.332847
21	K	0.27	0.428319

Between groups F-matrix -- df = 14 26

	1	2	3	4
1	0.000			
2	5.425	0.000		
3	9.792	12.439	0.000	
4	18.977	18.456	10.555	0.000

Wilks' lambda
Lambda = 0.0035 df = 14 3 39
Approx. F= 10.5469 df = 42 77 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
6 BA	0.39	0.256341	5 AS	0.30	0.184164
10 CA	1.64	0.337223	7 BE	0.22	0.412578
11 CR	1.61	0.026825	21 K	0.33	0.436719
12 CO	0.88	0.019725			
13 CU	20.42	0.367824			
14 FE	2.89	0.055747			
15 PB	0.35	0.463928			
16 MG	1.07	0.129130			
17 MN	0.46	0.162290			
19 MO	2.67	0.245014			
20 NI	0.40	0.151460			
24 NA	5.19	0.105284			
26 V	2.72	0.014132			
28 PH	2.84	0.200239			

Between groups F-matrix -- df = 13 27

	1	2	3	4
1	0.000			
2	5.941	0.000		
3	10.943	13.750	0.000	
4	20.872	20.592	11.426	0.000

Wilks' lambda
Lambda = 0.0036 df = 13 3 39
Approx. F= 11.6641 df = 39 80 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
6 BA	0.39	0.257640	5 AS	0.20	0.203971
10 CA	1.70	0.343640	7 BE	0.21	0.444989
11 CR	1.82	0.028029	15 PB	0.35	0.463928
12 CO	0.56	0.027242	21 K	0.36	0.442767
13 CU	26.51	0.431064			
14 FE	2.83	0.070740			
16 MG	1.03	0.130395			
17 MN	1.19	0.274772			
19 MO	3.07	0.245653			
20 NI	0.41	0.151557			
24 NA	5.46	0.105289			
26 V	2.93	0.014181			
28 PH	3.14	0.202236			

Between groups F-matrix -- df = 12 28

	1	2	3	4
1	0.000			
2	6.355	0.000		
3	12.211	15.390	0.000	
4	23.445	22.918	12.791	0.000

Wilks' lambda
Lambda = 0.0038 df = 12 3 39
Approx. F= 12.9526 df = 36 83 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
10 CA	2.02	0.346299	5 AS	0.15	0.209340

11	CR	2.20	0.034501	6	BA	0.39	0.257640
12	CO	0.58	0.027399	7	BE	0.18	0.471256
13	CU	30.00	0.445095	15	PB	0.35	0.466280
14	FE	2.61	0.075314	21	K	0.24	0.462844
16	MG	1.11	0.151286				
17	MN	1.08	0.281547				
19	MO	4.02	0.355646				
20	NI	0.44	0.155538				
24	NA	6.28	0.113884				
26	V	3.54	0.015489				
28	PH	3.09	0.207174				

Between groups F-matrix -- df = 11 29

	1	2	3	4
1	0.000			
2	7.170	0.000		
3	13.342	16.869	0.000	
4	25.444	24.805	14.365	0.000

Wilks' lambda
Lambda = 0.0039 df = 11 3 39
Approx. F= 14.4626 df = 33 86 prob = 0.0000

Variable		F-to-remove	Tolerance	Variable		F-to-enter	Tolerance
10	CA	2.43	0.352435	5	AS	0.15	0.210106
11	CR	1.90	0.037216	6	BA	0.42	0.264408
12	CO	0.56	0.028029	7	BE	0.15	0.475099
13	CU	29.94	0.457741	15	PB	0.36	0.466372
14	FE	2.88	0.078238	20	NI	0.44	0.155538
16	MG	1.05	0.157529	21	K	0.24	0.463653
17	MN	1.18	0.286268				
19	MO	4.70	0.389207				
24	NA	6.06	0.120301				
26	V	3.55	0.019596				
28	PH	4.03	0.215004				

Between groups F-matrix -- df = 10 30

	1	2	3	4
1	0.000			
2	8.041	0.000		
3	15.140	18.946	0.000	
4	28.205	27.993	15.405	0.000

Wilks' lambda
Lambda = 0.0042 df = 10 3 39
Approx. F= 16.0451 df = 30 88 prob = 0.0000

Variable		F-to-remove	Tolerance	Variable		F-to-enter	Tolerance
10	CA	2.53	0.352664	5	AS	0.25	0.221014
11	CR	3.41	0.049168	6	BA	0.44	0.265115
13	CU	38.53	0.540666	7	BE	0.15	0.476646
14	FE	3.66	0.122700	12	CO	0.56	0.028029
16	MG	2.26	0.178661	15	PB	0.02	0.643875
17	MN	3.77	0.465162	20	NI	0.43	0.159110

```
19 MO              5.39   0.389424 |   21 K              0.29   0.479940
24 NA              6.18   0.121054 |
26 V               3.72   0.019598 |
28 PH              4.27   0.215017 |
```

Classification matrix (cases in row categories classified into columns)

	1	2	3	4	%correct
1	14	0	0	0	100
2	1	9	0	0	90
3	0	0	9	0	100
4	0	0	0	10	100
Total	15	9	9	10	98

Jackknifed classification matrix

	1	2	3	4	%correct
1	12	1	1	0	86
2	1	9	0	0	90
3	1	0	8	0	89
4	0	0	0	10	100
Total	14	10	9	10	91

Classification matrix (cases in row categories classified into columns)

	1	2	3	4	%correct
1	14	0	0	0	100
2	1	9	0	0	90
3	0	0	9	0	100
4	0	0	0	10	100
Total	15	9	9	10	98

Jackknifed classification matrix

	1	2	3	4	%correct
1	12	1	1	0	86
2	1	9	0	0	90
3	1	0	8	0	89
4	0	0	0	10	100
Total	14	10	9	10	91

Eigenvalues

11.960	4.540	2.342

Canonical correlations

0.961	0.905	0.837

Cumulative proportion of total dispersion

0.635	0.876	1.000

Wilks' lambda= 0.004
Approx.F= 16.179 df= 30, 88 p-tail= 0.0000

Pillai's trace= 2.443
Approx.F= 14.039 df= 30, 96 p-tail= 0.0000

Lawley-Hotelling trace= 18.842
Approx.F= 18.005 df= 30, 86 p-tail= 0.0000

Canonical discriminant functions

	1	2	3
Constant	7.186	-0.565	4.476
AS	.	.	.
BA	.	.	.
BE	.	.	.
CA	0.000	0.000	0.000
CR	-0.085	-0.093	0.007
CO	.	.	.
CU	-0.002	0.000	0.000
FE	0.000	0.000	0.000
PB	.	.	.
MG	0.000	-0.001	-0.000
MN	0.002	-0.004	-0.007
MO	0.009	-0.095	-0.036
NI	.	.	.
K	.	.	.
NA	-0.013	-0.015	0.002
V	0.058	0.095	-0.042
PH	-1.011	0.518	-0.645

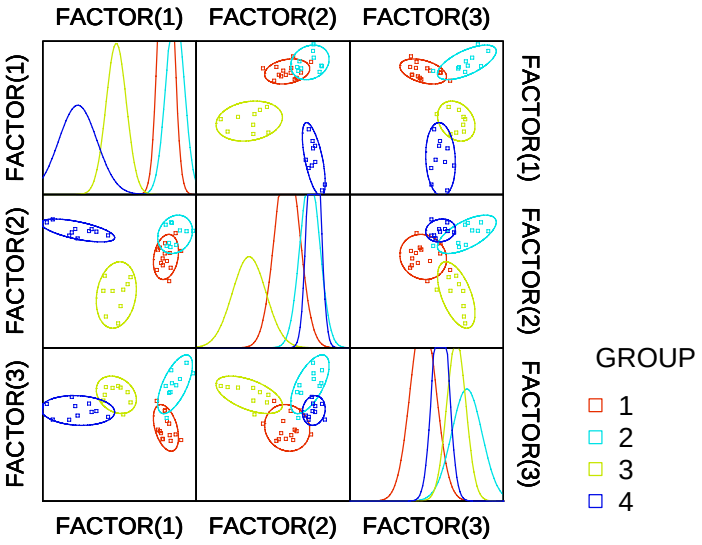
Canonical discriminant functions -- standardized by within variances

	1	2	3
AS	.	.	.
BA	.	.	.
BE	.	.	.
CA	0.568	0.070	0.621
CR	-1.641	-1.806	0.137
CO	.	.	.
CU	-1.214	0.361	0.036
FE	0.320	0.588	1.605
PB	.	.	.
MG	0.534	-0.946	-0.216
MN	0.215	-0.439	-0.743
MO	0.094	-0.983	-0.375
NI	.	.	.
K	.	.	.
NA	-1.255	-1.425	0.230
V	1.998	3.264	-1.421
PH	-0.989	0.507	-0.631

Canonical scores of group means

	1	2	3
1	2.436	-0.295	-1.787
2	3.206	1.625	1.906
3	-1.770	-3.517	1.015
4	-5.024	1.952	-0.319

Canonical Scores Plot



Predicted group indicator and canonical discriminant scores are saved.
43 cases have been saved.

Means

AS	BA	BE	CA	CR
3.134	150.953	0.664	7990.860	18.937

CO	CU	FE	PB	MG
10.556	1854.988	21486.977	45.049	2836.047

MN	MO	NI	K	NA
373.953	15.240	15.070	2076.977	128.281

V	PH	SCORE1	SCORE2	SCORE3
38.235	6.310	0.000	0.000	0.000

Pearson correlation matrix

	AS	BA	BE	CA	CR
AS	1.000				
BA	0.737	1.000			
BE	0.210	0.305	1.000		
CA	0.180	0.319	0.311	1.000	
CR	-0.199	0.160	-0.094	0.034	1.000
CO	-0.029	0.342	0.108	0.225	0.896
CU	0.702	0.638	0.518	0.426	-0.264
FE	0.026	0.158	-0.174	0.166	0.763
PB	0.477	0.345	0.138	0.160	-0.234
MG	-0.067	0.350	0.284	0.323	0.692
MN	-0.397	0.024	0.217	0.133	0.579
MO	0.885	0.592	-0.040	-0.113	-0.280
NI	0.009	0.300	0.065	0.126	0.806
K	0.244	0.373	0.686	0.548	-0.032
NA	0.036	0.295	-0.146	-0.160	0.578
V	-0.232	0.093	-0.136	0.004	0.952
PH	-0.114	0.176	0.398	0.740	0.160
SCORE1	-0.637	-0.641	-0.509	-0.368	0.273
SCORE2	-0.432	-0.400	0.117	0.475	0.113
SCORE3	0.328	-0.067	-0.264	0.119	-0.394

	CO	CU	FE	PB	MG
CO	1.000				
CU	-0.028	1.000			
FE	0.835	-0.156	1.000		
PB	-0.097	0.478	-0.145	1.000	
MG	0.840	-0.023	0.665	-0.128	1.000
MN	0.678	-0.229	0.352	0.080	0.646
MO	-0.174	0.501	-0.035	0.333	-0.264
NI	0.867	-0.021	0.722	-0.115	0.797
K	0.194	0.627	0.070	0.213	0.358
NA	0.579	-0.174	0.500	-0.140	0.630
V	0.894	-0.306	0.807	-0.251	0.758
PH	0.368	0.274	0.149	0.123	0.513
SCORE1	0.069	-0.960	0.270	-0.457	0.027
SCORE2	0.131	0.064	0.152	-0.094	0.064
SCORE3	-0.412	0.143	0.043	-0.069	-0.458

	MN	MO	NI	K	NA
MN	1.000				
MO	-0.550	1.000			
NI	0.562	-0.106	1.000		
K	0.118	-0.002	0.145	1.000	
NA	0.341	0.061	0.673	-0.158	1.000
V	0.605	-0.298	0.860	-0.070	0.722
PH	0.545	-0.444	0.303	0.593	-0.065
SCORE1	0.180	-0.436	0.031	-0.598	0.098
SCORE2	0.213	-0.649	0.042	0.324	-0.438
SCORE3	-0.839	0.436	-0.435	-0.047	-0.338

	V	PH	SCORE1	SCORE2	SCORE3
V	1.000				
PH	0.160	1.000			
SCORE1	0.319	-0.330	1.000		
SCORE2	0.099	0.584	0.000	1.000	
SCORE3	-0.412	-0.413	0.000	0.000	1.000

Number of observations: 43

OUTPUT FOR MODEL 2

Backward stepwise with Alpha-to-Enter=0.150 and Alpha-to-Remove=0.150

Group frequencies

1	2	3	4
14	10	9	10

Group means

	1	2	3	4
AS	1.744	2.056	5.376	4.140
BA	130.279	101.510	202.556	182.900
BE	0.651	0.567	0.648	0.793
CA	3942.143	9176.700	3577.778	16445.000
CR	30.850	17.010	7.733	14.270
CO	13.014	8.950	8.111	10.920
FE	22726.429	25460.000	18063.333	18860.000
PB	34.629	17.380	61.567	72.440
MG	3508.571	2234.000	2303.333	2976.000
MN	525.786	279.800	229.222	385.800
MO	3.993	8.520	40.322	15.130
NI	20.414	9.770	11.411	16.180
K	1782.143	1890.000	1941.111	2799.000
NA	177.714	66.190	174.067	79.960
V	61.750	35.260	17.522	26.930
PH	6.459	5.865	5.009	7.718
CD	0.529	0.428	1.650	3.280
AL	11402.857	8508.000	8946.667	11738.000
ZN	115.779	37.280	108.267	162.920

Between groups F-matrix -- df = 19 21

	1	2	3	4
1	0.000			
2	3.562	0.000		
3	6.921	9.035	0.000	
4	9.031	7.402	12.599	0.000

Wilks' lambda

Lambda = 0.0026 df = 19 3 39

Approx. F= 7.0170 df = 57 63 prob = 0.0000

Classification functions

	1	2	3	4
CONSTANT	-167.866	-158.144	-159.823	-230.090

AS	-17.003	-17.413	-16.302	-17.016
BA	0.047	0.100	0.113	0.101
BE	138.465	135.721	136.521	138.478
CA	-0.002	-0.001	-0.002	-0.001
CR	1.089	0.858	1.197	1.055
CO	-10.981	-12.947	-6.234	-13.726
FE	0.002	0.004	0.001	0.003
PB	0.367	0.562	-0.158	1.488
MG	-0.027	-0.030	-0.023	-0.038
MN	-0.004	-0.012	-0.071	-0.002
MO	2.276	1.711	2.807	1.102
NI	-1.205	-1.198	-0.896	-1.032
K	-0.033	-0.031	-0.023	-0.032
NA	0.012	-0.033	0.130	0.003
V	0.662	0.869	-0.014	0.873
PH	46.202	43.245	42.879	49.934
CD	5.812	7.801	2.779	15.096
AL	0.013	0.014	0.010	0.016
ZN	-0.078	-0.144	0.084	-0.407

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
5 AS	0.02	0.109980			
6 BA	0.53	0.235267			
7 BE	0.01	0.290818			
10 CA	1.59	0.277454			
11 CR	0.17	0.027047			
12 CO	2.31	0.013413			
14 FE	3.77	0.039835			
15 PB	6.69	0.009155			
16 MG	2.72	0.059796			
17 MN	1.19	0.131415			
19 MO	2.15	0.065003			
20 NI	0.32	0.142009			
21 K	0.96	0.238782			
24 NA	3.70	0.107197			
26 V	1.52	0.013476			
28 PH	0.96	0.117288			
9 CD	4.25	0.240728			
3 AL	2.13	0.052759			
27 ZN	7.45	0.008021			

Between groups F-matrix -- df = 18 22

	1	2	3	4
1	0.000			
2	3.933	0.000		
3	7.650	9.990	0.000	
4	9.987	8.180	13.930	0.000

Wilks' lambda
Lambda = 0.0026 df = 18 3 39
Approx. F= 7.7665 df = 54 66 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
5 AS	0.04	0.134559	7 BE	0.01	0.290818
6 BA	0.61	0.244800			
10 CA	1.67	0.279212			

11	CR	0.18	0.027053
12	CO	2.45	0.013561
14	FE	4.26	0.041376
15	PB	7.03	0.009194
16	MG	3.02	0.062479
17	MN	1.40	0.140133
19	MO	2.40	0.068315
20	NI	0.34	0.142464
21	K	1.19	0.292615
24	NA	3.87	0.107267
26	V	1.64	0.013857
28	PH	1.07	0.133837
9	CD	4.59	0.244591
3	AL	2.23	0.052774
27	ZN	7.80	0.008021

Between groups F-matrix -- df = 17 23

	1	2	3	4
1	0.000			
2	4.337	0.000		
3	8.454	11.008	0.000	
4	11.055	9.041	15.407	0.000

Wilks' lambda
Lambda = 0.0026 df = 17 3 39
Approx. F= 8.5972 df = 51 69 prob = 0.0000

Variable		F-to-remove	Tolerance	Variable		F-to-enter	Tolerance
6	BA	0.64	0.245122	5	AS	0.04	0.134559
10	CA	1.72	0.281545	7	BE	0.03	0.355815
11	CR	0.24	0.028732				
12	CO	2.68	0.014905				
14	FE	4.45	0.042719				
15	PB	7.38	0.009199				
16	MG	3.17	0.062524				
17	MN	1.48	0.140314				
19	MO	5.88	0.109249				
20	NI	0.34	0.145110				
21	K	1.37	0.335921				
24	NA	4.01	0.108236				
26	V	1.75	0.013885				
28	PH	1.33	0.149075				
9	CD	5.75	0.276204				
3	AL	2.79	0.062963				
27	ZN	8.21	0.008031				

Between groups F-matrix -- df = 16 24

	1	2	3	4
1	0.000			
2	4.653	0.000		
3	9.336	11.920	0.000	
4	12.254	9.924	17.030	0.000

Wilks' lambda
Lambda = 0.0027 df = 16 3 39
Approx. F= 9.4381 df = 48 72 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
6 BA	0.71	0.299570	5 AS	0.09	0.142911
10 CA	1.90	0.281858	7 BE	0.05	0.360961
12 CO	4.84	0.017862	11 CR	0.24	0.028732
14 FE	7.54	0.047174			
15 PB	7.70	0.009201			
16 MG	3.28	0.063803			
17 MN	1.99	0.159579			
19 MO	6.01	0.113004			
20 NI	0.34	0.146184			
21 K	1.62	0.355392			
24 NA	4.94	0.150485			
26 V	3.64	0.033585			
28 PH	1.34	0.150655			
9 CD	7.91	0.309257			
3 AL	3.26	0.065807			
27 ZN	8.66	0.008036			

Between groups F-matrix -- df = 15 25

	1	2	3	4
1	0.000			
2	5.165	0.000		
3	9.974	12.964	0.000	
4	13.461	10.935	18.868	0.000

Wilks' lambda
Lambda = 0.0028 df = 15 3 39
Approx. F= 10.3471 df = 45 75 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
6 BA	0.56	0.325051	5 AS	0.08	0.146279
10 CA	2.09	0.286746	7 BE	0.05	0.361064
12 CO	5.09	0.017866	11 CR	0.24	0.028945
14 FE	8.33	0.047609	20 NI	0.34	0.146184
15 PB	8.05	0.009215			
16 MG	3.41	0.064046			
17 MN	2.19	0.159638			
19 MO	7.38	0.121359			
21 K	1.52	0.365049			
24 NA	4.94	0.153125			
26 V	3.83	0.041327			
28 PH	1.59	0.169127			
9 CD	8.24	0.309285			
3 AL	3.40	0.069712			
27 ZN	9.07	0.008047			

Between groups F-matrix -- df = 14 26

	1	2	3	4
1	0.000			
2	5.575	0.000		
3	10.608	14.369	0.000	
4	14.741	12.179	20.983	0.000

Wilks' lambda
Lambda = 0.0030 df = 14 3 39
Approx. F= 11.1329 df = 42 77 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
10 CA	2.32	0.290443	5 AS	0.07	0.152224
12 CO	6.83	0.019410	6 BA	0.56	0.325051
14 FE	11.29	0.055076	7 BE	0.08	0.366882
15 PB	8.38	0.009218	11 CR	0.22	0.036596
16 MG	3.56	0.066007	20 NI	0.17	0.158618
17 MN	2.71	0.161478			
19 MO	9.32	0.134932			
21 K	1.49	0.368383			
24 NA	5.32	0.153163			
26 V	4.18	0.041383			
28 PH	1.62	0.171391			
9 CD	8.55	0.310358			
3 AL	3.52	0.069892			
27 ZN	9.44	0.008048			

Between groups F-matrix -- df = 13 27

	1	2	3	4
1	0.000			
2	6.225	0.000		
3	9.841	14.549	0.000	
4	16.485	13.609	21.679	0.000

Wilks' lambda
Lambda = 0.0035 df = 13 3 39
Approx. F= 11.7472 df = 39 80 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
10 CA	2.36	0.291553	5 AS	0.08	0.167386
12 CO	5.82	0.021502	6 BA	0.50	0.328019
14 FE	10.83	0.059689	7 BE	0.17	0.411464
15 PB	8.11	0.009671	11 CR	0.46	0.037863
16 MG	3.67	0.066257	20 NI	0.10	0.161391
17 MN	2.63	0.164661	21 K	1.49	0.368383
19 MO	8.84	0.142071			
24 NA	4.25	0.173348			
26 V	4.53	0.041721			
28 PH	1.59	0.179199			
9 CD	8.51	0.331547			
3 AL	2.95	0.096809			
27 ZN	9.10	0.008474			

Between groups F-matrix -- df = 12 28

	1	2	3	4
1	0.000			
2	6.663	0.000		
3	11.054	16.112	0.000	
4	17.197	12.739	23.208	0.000

Wilks' lambda
Lambda = 0.0042 df = 12 3 39
Approx. F= 12.4361 df = 36 83 prob = 0.0000

Variable	F-to-remove	Tolerance	Variable	F-to-enter	Tolerance
10 CA	4.84	0.461894	5 AS	0.27	0.175019
12 CO	6.15	0.021650	6 BA	0.52	0.331135
14 FE	11.36	0.063075	7 BE	0.17	0.424861
15 PB	15.50	0.010068	11 CR	0.47	0.037904
16 MG	3.45	0.079990	20 NI	0.38	0.174246
17 MN	4.47	0.194915	21 K	1.46	0.385164
19 MO	15.53	0.155169	28 PH	1.59	0.179199
24 NA	4.36	0.174047			
26 V	4.57	0.042600			
9 CD	11.37	0.333098			
3 AL	2.54	0.110625			
27 ZN	18.54	0.008901			

Classification matrix (cases in row categories classified into columns)

	1	2	3	4	%correct
1	14	0	0	0	100
2	1	9	0	0	90
3	0	0	9	0	100
4	0	0	0	10	100
Total	15	9	9	10	98

Jackknifed classification matrix

	1	2	3	4	%correct
1	13	0	1	0	93
2	1	9	0	0	90
3	1	0	8	0	89
4	0	1	0	9	90
Total	15	10	9	9	91

Classification matrix (cases in row categories classified into columns)

	1	2	3	4	%correct
1	14	0	0	0	100
2	1	9	0	0	90
3	0	0	9	0	100
4	0	0	0	10	100
Total	15	9	9	10	98

Jackknifed classification matrix

	1	2	3	4	%correct
1	13	0	1	0	93
2	1	9	0	0	90
3	1	0	8	0	89
4	0	1	0	9	90
Total	15	10	9	9	91

Eigenvalues

10.534	5.475	2.217

Canonical correlations

0.956	0.920	0.830

Cumulative proportion of total dispersion

0.578	0.878	1.000

Wilks' lambda= 0.004
Approx.F= 12.505 df= 36, 83 p-tail= 0.0000

Pillai's trace= 2.448
Approx.F= 11.088 df= 36, 90 p-tail= 0.0000

Lawley-Hotelling trace= 18.227
Approx.F= 13.501 df= 36, 80 p-tail= 0.0000

Canonical discriminant functions

	1	2	3
Constant	-4.575	-1.631	1.970
AS	.	.	.
BA	.	.	.
BE	.	.	.
CA	0.000	0.000	0.000
CR	.	.	.
CO	-0.749	0.449	0.016
FE	0.000	-0.000	0.000
PB	0.177	0.064	-0.034
MG	-0.001	0.000	-0.000
MN	0.008	-0.004	-0.009
MO	-0.203	0.002	-0.001
NI	.	.	.
K	.	.	.
NA	-0.010	0.012	0.001
V	0.070	-0.043	-0.030
PH	.	.	.
CD	1.311	0.506	0.016
AL	0.000	0.000	0.000
ZN	-0.053	-0.016	0.009

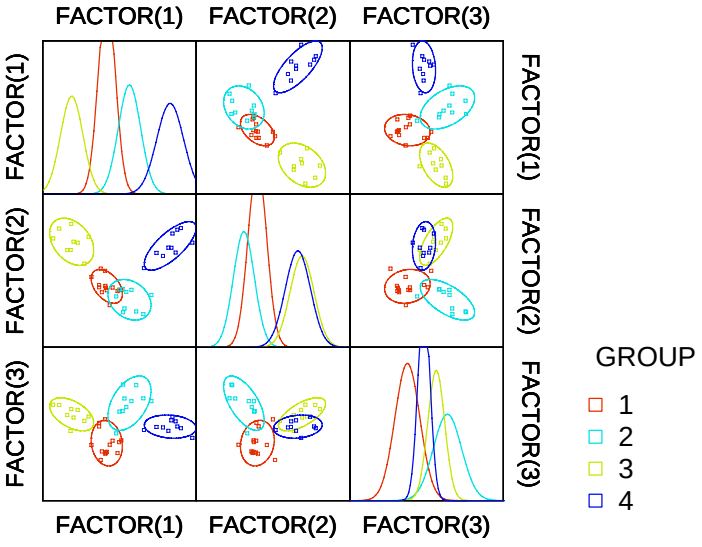
Canonical discriminant functions -- standardized by within variances

	1	2	3
AS	.	.	.
BA	.	.	.
BE	.	.	.
CA	0.859	0.022	0.308
CR	.	.	.
CO	-3.881	2.327	0.085
FE	2.439	-1.508	1.396
PB	7.686	2.777	-1.481
MG	-1.872	0.049	-0.500
MN	0.902	-0.475	-1.028
MO	-2.099	0.016	-0.014
NI	.	.	.
K	.	.	.
NA	-0.938	1.096	0.129
V	2.379	-1.466	-1.026
PH	.	.	.
CD	1.260	0.486	0.016
AL	1.449	0.011	0.159
ZN	-8.579	-2.656	1.493

Canonical scores of group means

	1	2	3
1	-1.154	-1.426	-1.750
2	0.911	-2.655	1.899
3	-4.351	2.647	0.880
4	4.621	2.269	-0.241

Canonical Scores Plot



Predicted group indicator and canonical discriminant scores are saved.
43 cases have been saved.

Means

AS	BA	BE	CA	CR
3.134	150.953	0.664	7990.860	18.937

CO	FE	PB	MG	MN
10.556	21486.977	45.049	2836.047	373.953

MO	NI	K	NA	V
15.240	15.070	2076.977	128.281	38.235

PH	SCORE1	SCORE2	SCORE3	AL
6.310	0.000	0.000	0.000	10293.488

CD	ZN
1.380	106.914

Pearson correlation matrix

	AS	BA	BE	CA	CR
AS	1.000				
BA	0.737	1.000			
BE	0.210	0.305	1.000		
CA	0.180	0.319	0.311	1.000	
CR	-0.199	0.160	-0.094	0.034	1.000
CO	-0.029	0.342	0.108	0.225	0.896
FE	0.026	0.158	-0.174	0.166	0.763
PB	0.477	0.345	0.138	0.160	-0.234
MG	-0.067	0.350	0.284	0.323	0.692
MN	-0.397	0.024	0.217	0.133	0.579
MO	0.885	0.592	-0.040	-0.113	-0.280
NI	0.009	0.300	0.065	0.126	0.806
K	0.244	0.373	0.686	0.548	-0.032
NA	0.036	0.295	-0.146	-0.160	0.578
V	-0.232	0.093	-0.136	0.004	0.952
PH	-0.114	0.176	0.398	0.740	0.160
SCORE1	-0.123	-0.099	0.339	0.555	0.011
SCORE2	0.772	0.736	0.404	0.170	-0.326
SCORE3	0.321	-0.087	-0.275	0.144	-0.398
AL	0.052	0.423	0.421	0.261	0.685
CD	0.582	0.511	0.482	0.411	-0.207
ZN	0.217	0.165	0.085	0.155	-0.091

	CO	FE	PB	MG	MN
CO	1.000				
FE	0.835	1.000			
PB	-0.097	-0.145	1.000		
MG	0.840	0.665	-0.128	1.000	
MN	0.678	0.352	0.080	0.646	1.000
MO	-0.174	-0.035	0.333	-0.264	-0.550
NI	0.867	0.722	-0.115	0.797	0.562
K	0.194	0.070	0.213	0.358	0.118
NA	0.579	0.500	-0.140	0.630	0.341
V	0.894	0.807	-0.251	0.758	0.605
PH	0.368	0.149	0.123	0.513	0.545
SCORE1	0.086	0.023	0.091	0.062	0.145
SCORE2	-0.121	-0.318	0.479	-0.056	-0.267
SCORE3	-0.413	0.050	-0.087	-0.458	-0.835
AL	0.839	0.614	-0.089	0.896	0.579
CD	0.019	-0.138	0.668	-0.004	-0.018
ZN	0.007	-0.056	0.940	-0.024	0.288

	MO	NI	K	NA	V
MO	1.000				
NI	-0.106	1.000			
K	-0.002	0.145	1.000		
NA	0.061	0.673	-0.158	1.000	
V	-0.298	0.860	-0.070	0.722	1.000
PH	-0.444	0.303	0.593	-0.065	0.160
SCORE1	-0.408	0.033	0.562	-0.407	-0.025
SCORE2	0.676	-0.058	0.381	0.071	-0.351
SCORE3	0.409	-0.419	-0.030	-0.362	-0.412
AL	-0.163	0.799	0.479	0.553	0.717
CD	0.322	-0.010	0.532	-0.182	-0.236
ZN	0.057	-0.042	0.127	-0.088	-0.092

	PH	SCORE1	SCORE2	SCORE3	AL
PH	1.000				
SCORE1	0.637	1.000			
SCORE2	0.047	0.000	1.000		
SCORE3	-0.341	0.000	0.000	1.000	
AL	0.426	0.201	0.088	-0.444	1.000
CD	0.340	0.443	0.712	0.004	0.130
ZN	0.187	0.087	0.212	-0.206	-0.041

	CD	ZN
CD	1.000	
ZN	0.546	1.000