

**COMPLETION REPORT  
FOR  
SIERRA ZINC MINE AND MILL  
COLVILLE, WASHINGTON**

**EPA ID No. WAN001002396**

**November 20, 2015**

**Prepared for:**

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## **List of Acronyms and Abbreviations**

cyds	Cubic yards
E&E	Ecology and Environment
EPA	Environmental Protection Agency
HDPE	High Density Polyethylene
µg/L	micrograms per liter
mg/L	milligrams per liter
MS/MSD	Matrix Spike/Matrix Spike Duplicates
MTCA	Model Toxics Control Act
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RMC	Resource Environmental Management Consultants, Inc.
RML	Removal Management Level
RSE	Removal Site Evaluation
RWP	Removal Work Plan
SPLP	Synthetic Precipitation Leaching Procedure

SSSP	Site Specific Sampling Plan
SWPPP	Storm Water Pollution Prevention Plan
TAL	Target Analyte List
XRF	Field-Portable X-Ray Fluorescence meter

## **1.0 INTRODUCTION**

This Completion Report documents that The Goldfield Corporation (Goldfield) has completed all response actions for the Sierra Zinc Mine and Mill (Site), EPA ID No. WAN001002396. The Removal Action was authorized by the Administrative Settlement Agreement and Order on Consent for Removal Action for the Sierra Zinc Mine Site in Colville, Stevens County, Washington, CERCLA Docket No. 10-2014-0168 [Settlement Agreement, (USEPA, 2014a)]. The Removal Action at the Site was conducted in accordance with the Time Critical Removal Action for the Sierra Zinc Mine and Mill Site [Action Memorandum, (USEPA, 2014b)] dated August 18, 2014.

This report was prepared by Resource and Environmental Management Consultants, Inc. (RMC), the lead project environmental consultant and project manager in accordance with Close Out Procedures for National Priorities List Sites (OSWER Directive 9320.2-09A-P) and Section VIII of the Settlement Agreement (USEPA, 2014).

The purpose of the Removal Action was to limit human and environmental exposure to the contaminants of concern and to reduce the mobility and migration of these contaminants. The Removal Action involved demolition of the mill and barn buildings, removal of lead-contaminated soils from various locations outside of the tailings impoundment, placement of lead-contaminated soils within the tailings impoundment, placement of high concentration lead wastes in a HDPE liner within the impoundment, re-contouring the tailings impoundment, placement of clean cover soils on the tailings impoundment, constructing a fence around the impoundment to restrict access, and revegetation of impacted areas.

## **2.0 SITE BACKGROUND AND SUMMARY OF CONDITIONS**

This section summarizes Site conditions, Action Memorandum requirements, cleanup goals, monitoring requirements and performance of the Removal Action.

## **2.1 Background**

The Site is a former lead and zinc mine and mill located in Stevens County approximately 24 miles north of Colville, Washington. A Site Location Map is presented in Figure 1. A Site Map is presented in Figure 2. The Site is located in a rural location with no sizable nearby population. The primary land use surrounding the Site is agricultural. Limited residential land use also occurs adjacent to and in the vicinity of the Site. The nearest surface water body is South Fork Deep Creek which is located approximately 500 feet east of the Site.

Operations at the Site began in 1889. Production was also reported in 1924, 1925, and 1941 through 1944. From 1940 to 1944 the Site was owned by the Sierra Zinc Company. The Site was then sold to Goldfield Consolidated Mines Company in 1949 Goldfield primarily operated the mill to process ore from surrounding mines. In 1960 Goldfield sold the mine back to Jamieson/Higgenbotham (Sierra Zinc Company). Records indicate that periodic mining activity and milling operations by various entities may have occurred at the Site from 1956 through approximately the mid- to late-1970s. The mill property and the majority of the tailings impoundment were sold to Mr. Ron Nixon in 1975 who still owns a portion of the Site. Other owners of portions of the Site include James Quilter, Arthur Arrington, and Arden Tree Farms.

## **2.2 Removal Action Performed**

The Removal Action consisted primarily of the excavation and on-site disposal of lead-contaminated soils, tailings, and waste rock, plus demolition of the mill and barn buildings. Contaminated soils and mine wastes were excavated and placed on the tailings impoundment with the exception of the material near the mill buildings which contained lead levels in excess of 10,000 parts per million (ppm) that was placed in a HDPE containment within the impoundment. The tailings impoundment was then covered with approximately 9 inches of eco-barrier (rock layer comprised of gravel to pebbly soil), 18-inches of clean cover soils and 6 inches of topsoil.

Approximately 88,000 cubic yards of contaminated soils and mine wastes were disposed of on the tailings impoundment. Approximately 106,000 cyds of clean cover soils were placed on the tailings impoundment. A total of 237 confirmation samples were collected using a field-portable x-ray fluorescent (XRF) unit. Details of the confirmation sampling are provided in Section 6.4.

Details of cleanup activities are presented in Section 3.0

### **2.3 Site Characterization**

Previous site characterization was conducted by the EPA, Washington State Department of Natural Resources, and RMC on behalf of The Goldfield Corporation. The data presented in these studies was sufficient to characterize conditions at the Site. No further site characterization data were necessary to conduct the Removal Action.

Ecology and Environmental (E&E), on behalf of EPA, performed a Preliminary Assessment/Site Inspection in 2001 (E&E, 2002). During the investigation, samples were collected from the waste rock and tailings piles. Sample results from the tailings and waste rock pile indicated the presence of lead concentrations that exceeded the Removal Management Level (RML) in all samples collected. Sample results indicated cadmium concentrations exceeded the Washington State Department of Ecology Model Toxics Control Act (MTCA) Method A soil cleanup level for unrestricted land uses in all samples collected, and mercury concentrations that exceeded the MTCA Method A soil cleanup level in three samples. These samples did not likewise exceed the RMLs for cadmium or mercury.

In 2003, the Washington State Department of Natural Resources, Division of Geology and Earth Resources completed an Inactive and Abandoned Mine Land Investigation. During the investigation samples were collected from the tailings pile and the flowing adit. Sample results indicated the presence of lead concentrations that exceeded the EPA

RML in both tailings pile samples. One tailings pile sample contained cadmium at concentrations exceeding the EPA RML and MTCA Method A soil cleanup levels. Surface water samples were collected from the adit in September 2001 and June 2002. Neither sample contained analytes that exceeded the surface water or groundwater standards for Washington State.

E&E, on behalf of EPA, completed a Removal Site Evaluation (RSE) for the EPA in July 2013 (E&E, 2013). The evaluation included the collection of soil, surface water, ground water, and sediment samples. Seventy-two discrete soil samples were taken in areas around the mill structure and tailings impoundment using an XRF unit. Six soil samples were submitted for laboratory analysis of the Target Analyte List (TAL) metals, and two of those samples were also analyzed for TAL metals via the Synthetic Precipitation Leaching Procedure (SPLP). Twelve tailings samples were collected from the surface of the tailings impoundment. SPLP analysis of the tailings samples indicated that none of the samples exceeded MTCA groundwater protection criteria. One co-located surface water/sediment sample was collected from the adit. One groundwater sample was collected from a residence adjacent to the Site. Two surface water samples were collected from South Fork Deep Creek, one upstream of the Site and one at Goldfield Mine Road adjacent to the Site.

RMC conducted site characterization work during 2013 concurrent with the RSE on behalf of The Goldfield Corporation. Site characterization work was conducted to verify the results of E&E data and to provide definition of the extents of surface and subsurface contamination. RMC conducted laboratory analysis of mill area surface soils, tailings impoundment surface soils, surface water, sediment, and groundwater. Seven surface soil samples were collected from various locations on and adjacent to the Site. Two surface water samples were collected from the adit. Samples were analyzed for total and dissolved TAL metals. Two groundwater samples were collected from nearby drinking water wells. Two co-located surface water/sediment sample sets were collected from South Fork Deep Creek, one sample set from upstream of the Site and one sample set from downstream of the Site. One additional sediment sample was collected from South

Fork Deep Creek at Goldfield Mine Road. Surface water samples were analyzed for total and dissolved TAL metals. Additional samples were also collected to determine the availability of on-Site borrow material.

In summary, the above described data was sufficient to define the extents of impacts and to define removal areas and processes.

## **2.4 Removal Action Summary**

The primary activity of the Removal Action consisted of the excavation and consolidation of approximately 86,000 cubic yards of off-impoundment wastes (exceeding 250 ppm of total lead). Approximately 540 cubic yards of fine-grained soils with high lead concentrations were excavated from the mill area and placed in a completely welded and sealed geomembrane (high density polyethylene [HDPE]) liner within the tailings impoundment. Approximately 106,000 cyds of clean cover soils were placed on the tailings impoundment.

RMC submitted a detailed Removal Work Plan (RWP; RMC, 2014a) that was approved by EPA and incorporated into the Agreement. EPA, Washington State Department of Ecology, and local tribal nations were in concurrence of all planned removal activities.

## **2.5 Costs and Covenants**

Construction costs of approximately \$1.3 million plus reimbursement of EPA oversight costs will be paid by Goldfield in accordance with the Agreement. Following the Removal Action, an Environmental Covenant (deed restriction) will be developed which will prohibit development, agricultural use, or any other disturbances that might compromise the integrity of the cover soils placed on the tailings impoundment.

## **2.6 Design Criteria**

Removal Action design followed material specifications detailed in the RWP (RMC, 2014a). Due to time constraints at the beginning of the Removal Action, final impoundment, wedge buttress and stormwater mitigation designs were completed following the approval of the RWP in the winter of 2014. Removal action designs of the impoundment and storm water drainages were based on long-term weather data and were designed to accommodate a 100-year peak discharge using appropriate software.

## **2.7 Community Involvement Activities Performed**

RMC coordinated with EPA to provide information regarding the Site, Removal Action, and Site history to the community. RMC developed and implemented community relations activities during the Removal Action. Lyndsey Fox acted as the Point of Contact for Community Relations during implementation of the Removal Action (RMC, 2014a).

## **2.8 Site Development**

No redevelopment will occur at the Site. The Site will have an Environmental Covenant (deed restriction), which will prohibit development, agricultural use, or any other disturbances that might compromise the integrity of the cover soils and vegetation placed on the tailings impoundment.

## **3.0 CONSTRUCTION ACTIVITIES**

Work was initiated in October 2014. Prior to construction, a Stormwater Pollution Prevention Plan (SWPPP) was prepared and Best Management Practices specified in the SWPPP were implemented. Cleanup activities began with the construction of a decontamination pad and stabilized construction entrance. The decontamination pad and stabilized construction entrance were constructed using rock that was screened from an on-site borrow area. This was followed by demolition of the mill and barn structures.



During excavation of contaminated materials, “fence line” air monitoring was conducted to ensure that fugitive dust controls were effective. Real-time lead and arsenic analysis utilizing a field-portable XRF was conducted during the Removal Action in each decision unit to guide excavation depths. Contaminated soils and other mine waste were excavated using a track hoe and were direct-loaded onto haul trucks. Contaminated soils and mine waste were placed on the tailings impoundment. High-lead soils (>9,999 ppm lead) excavated from the mill area were placed in a HDPE liner in the southwest corner of the tailings impoundment. Following the excavation of high-lead soils the HDPE liner was welded and covered with tailings. Approximately 42 tons of scrap metal that was recovered during building demolition was recycled by Real Steel Recycling. A majority of the wood from the demolished mill and barn structures was evenly distributed within the tailings pile and mechanically crushed in place.

During the removal action, the barn and mill buildings were demolished. Approximately 42 tons of scrap metal was recycled by Real Steel Recycling and barn wood was broken down using tracked heavy machinery. During demolition of the barn and mill buildings, a total of nine drums were discovered. Caution was exercised during removal of the drums from the barn and mill buildings. All drums were placed near the former oil storage shed and wrapped in plastic until they were removed and transported to appropriate disposal facilities by Clean Harbors and Emerald Services.

During the removal action, conveyance piping was discovered and placed in the tailings impoundment and covered. The location of the piping was logged using a global positioning system.

Trees and other large woody material removed during the removal action were stockpiled on-site. Care was taken to remove visible tailings from root balls. Stockpiles were placed at multiple locations following discussion with individual landowners and were made available for their personal use.

Confirmation sampling was conducted after contaminated soil removal was completed. Confirmation sample locations are presented on Figure 3.

Following excavation of contaminated materials, shaping of the tailings impoundment and storm water drainage channels was completed. The tailings impoundment was covered following specifications detailed in the RWP (RMC, 2014a). Eco-barrier, cover soils and topsoil were excavated from properties adjacent to the Site. Each cover layer (eco-barrier, cover soil, and topsoil) was placed in 6-inch lifts and compacted with tracked machinery to achieve adequate density. Compaction testing was completed at three locations on the impoundment and one location on the wedge buttress (Appendix D). A proctor density of 85% or higher was achieved in all locations. Proctor density percentage ranged from 88.4% (wedge buttress) to 94.2% (southeast corner of impoundment). Thickness of each cover layer was documented through the use of grade stakes. Photo documentation of thicknesses occurred throughout eco-barrier, cover soil, and topsoil placement. The tailings impoundment and surrounding disturbed areas were revegetated with shallow-rooted grasses after placement of topsoil.

During the course of the removal, additional contamination was discovered. The majority of the material was removed and consolidated within the capped impoundment. In a heavily treed area immediately east of the tailings impoundment, contaminated tailings were discovered. Due to logistics of accessing the contaminated tailings and the reluctance of the property owner to have the trees disturbed, it was determined to remove as much contaminated material as practical without removing any of the trees themselves. The area was then capped in place with six inches of eco-barrier and 18 inches of cover soils and topsoil.

Native soils with elevated lead levels near the carpentry building [approximately 350 feet south of the impoundment and 150 feet east of the adit] and in trees east of Goldfield Mine Road [south of the slough area] were not remediated. Test pits were dug in both locations to determine full extent of contaminated native soils. Average lead concentrations near the carpentry building were below 350 ppm. East of Goldfield Mine

Road, native soils contained between 310 ppm lead to 465 ppm lead at a depth of two feet and one foot, respectively. In both locations described above, there were no visible tailings and vegetative growth was plentiful. Because this area consisted of native soils and did not have mill impacted soils nor tailings, it was determined this area could be left in place.

#### **4.0 CHRONOLOGY OF EVENTS**

Significant dates and projects milestones for the project include:

- August 18, 2014 – Action Memorandum for the Sierra Zinc Mine and Mill Site located near Colville, Stevens County, Washington was submitted to Chris Field, Program Manager
- September 11, 2014 – The Removal Work Plan was finalized
- September 15, 2014 – Effective date of Administrative Settlement Agreement and Order on Consent for Removal Action
- September 10, 2014 – Preparation and mobilization for remedial activities
- October 12, 2014 – Excavation of contaminated materials starts
- October 13, 2014 - Mill demolition began
- November 10, 2014 - Geomembrane sealed
- November 26, 2014 - Closed the Site for the season
- May 18, 2015 - Work began in 2015
- June 22, 2015 - 1<sup>st</sup> confirmation sampling event
- June 30, 2015 – End of excavation of contaminated material and hauling activities
- August 3, 2015 - 2<sup>nd</sup> confirmation sampling event
- August 14, 2015 – End of eco-barrier, cover and topsoil placement
- September 15, 2015 – Impoundment surface sampling event
- Spring of 2016 – Final Inspection with EPA

#### **5.0 PERFORMANCE STANDARDS AND DEMONSTRATION OF CLEANUP ACTIVITY QA/QC**

Quality Assurance/Quality Control protocols for the Removal Action were presented in the Quality Assurance Project Plan (QAPP, RMC, 2014b) and Site Specific Sampling Plan (SSSP, RMC, 2015a). All procedures for soil and air sample analysis during the Removal Action are documented in the RWP (RMC, 2014). The procedures and methodologies presented in the RWP were followed during all stages of the Removal Action. Only EPA analytical methods or, where no EPA methods existed, other federally-approved methods were used (such as National Institute of Occupational Safety and Health Method 7300 for analysis of airborne contaminants). All samples were analyzed by laboratories certified by the State of Washington.

Site inspections were conducted by RMC as part of remedial oversight. In addition, site visits by EPA and its START Contractor, E&E, were conducted on a periodic basis.

## **5.1 Demonstration of Cleanup Activity Quality Assurance and Quality Control**

A data quality assessment was conducted to ensure that the data quality requirements presented in the QAPP was followed.

### **Air Monitoring Samples**

- A total of 82 samples were analyzed (Table 1).
- No field blanks were collected.
- Three air samples were not analyzed due to damage during shipment to ALS Environmental Laboratories.

### **Surface Water Samples**

- Surface water samples were collected from the adit on a quarterly basis beginning in October 2014 and ending in July 2015. A first quarter sample was not collected in 2015 due to weather conditions.

- Upstream and downstream samples were collected from South Fork Deep Creek prior to beginning work and following completion of the Removal Action.
- Samples were collected and handled following procedures described in the QAPP and SSSP

### **Barrel Characterization and SPLP Testing**

- One barrel sample was analyzed to determine the appropriate disposal facility.
- One concrete sample collected from the mill was analyzed for SPLP RCRA 8 metals (Table 3-1 and Table 3-2).
- Samples were collected and handled in accordance with EPA guidance.
- Reporting limits were met on all samples.
- Holding times were met on all samples.
- Pace Laboratories analyzed matrix spike, duplicate, method (prep) blank and laboratory control samples for each sample batch.

### **Confirmation Soil Samples**

- Forty-seven composite and 187 discrete XRF confirmation soil samples were collected (Table 4-1 and Table 4-2). Seven composite field duplicates were collected. The field duplicate frequency of 14% exceeds the 10% frequency specified in the SSSP.
- Samples were collected and handled in accordance with procedures described in the QAPP and SSSP.
- Reporting limits were met on all samples.
- Holding times were met on all samples except SZ-TS-07142015. The holding time of for mercury analysis (28 days) was not met.
- Pace Laboratories analyzed matrix spike, duplicate, method (prep) blank and laboratory control samples for each sample batch.

## **Eco-barrier, Cover, and Topsoil Samples**

- Cover materials (eco-barrier, cover soil, topsoil) were sampled every 5,000 cyds during cover installation. A total of three eco-barrier, twelve cover soil, and three topsoil samples were collected (Table 5). All samples were collected as discrete grab samples and analyzed via XRF.

## **Data Quality Summary**

Based on comparison of primary air sample results with laboratory duplicates and laboratory blanks, the data are precise.

Based on comparison of primary surface water and soil sample results with field duplicate sample results, laboratory duplicates and matrix spike/matrix spike duplicates (MS/MSD), the data are precise. Based on percent recoveries of the MS/MSD samples and laboratory control samples the data can be considered accurate, e.g. the data can be used with a high degree of confidence.

## **6.0 MONITORING RESULTS, CERTIFICATION AND FINAL INSPECTIONS**

This section details the results of data collected during the Removal Action. Analytical laboratory reports are provided in Appendix B. A quality assurance review was performed on sampling objectives, field procedures and validation of laboratory results from samples submitted for laboratory analysis described below (RMC, 2015b).

### **6.1 Air Monitoring/Sampling**

Air monitoring samples were collected from locations upwind, downwind and within the work area. Air monitoring results are presented in Table 1.

Thirty-nine upwind samples did not contain detectable concentrations of lead.

Two out of 17 downwind samples contained detectable concentrations of lead. Samples did not contain lead concentrations greater than the National Ambient Air Quality Standards.

Work area samples were collected in the loading areas, on the tailings impoundment and on a person or equipment in the excavation area. A total of 26 work area samples were collected. Work area samples did not contain detectable concentrations of lead. Two upwind samples and one downwind sample were not analyzed due to damage during shipment. Ambient air sample results did not exceed Occupational Safety and Health Administration permissible exposure limits or action levels.

## **6.2 Surface Water Sampling**

Surface water samples were collected from the adit and South Fork Deep Creek. Adit samples were collected on a quarterly basis.

Surface water samples were collected from South Fork Deep Creek upstream and downstream of the Gold Mine Road Crossing where dust control water was extracted. Samples were collected prior to implementation of the Removal Action and following project completion (Figure 4). There were no significant changes in Water Quality between the two time periods.

Surface water analytical results for the adit and South Fork Deep Creek are presented in Table 2.

## **6.3 Unknown barrel and SPLP Sampling**

One barrel found on-site contained an unknown substance and was analyzed by ALS Environmental Laboratories to determine its contents. Analytical results are presented in

Table 3-1. Following laboratory analysis, the barrel was removed and disposed of by Clean Harbors. A total of nine barrels were removed from the Site in March 2015.

Mill concrete was sampled and analyzed for SPLP RCRA 8 metals. Prior to shipment to Pace Laboratories for analysis, RMC briefly washed the concrete sample with triple superphosphate. The mill concrete sample contained 0.022 mg/L of chromium while all other metals were below the detection limit (Table 3-2). Following SPLP analysis, and in coordination with EPA, RMC decided to wash any surficial contamination off the concrete and leave the large sections in place.

#### **6.4 Confirmation Sampling**

As per the RWP, QAPP, and SSSP (RMC, 2014a; RMC, 2014b; RMC, 2015a), confirmation sampling was conducted to confirm the removal of contaminated soils. Forty-seven grid locations were sampled on a 100-foot by 100-foot grid basis in Decision Units 2, 9 and 10 as described in the SSSP. XRF confirmation sample results are provided in Table 4-1. Off-site fixed laboratory analytical results are provided in Table 4-2. Twenty discrete XRF confirmation samples were collected from DU-2 with lead concentrations ranging from non-detect in two of the samples to 124 ppm. From these locations, three samples were additionally submitted for off-site fixed laboratory analysis with lead concentrations ranging from 45.0 mg/kg to 65.9 mg/kg. Twenty-six discrete XRF confirmation samples were collected from DU- 9 with lead concentrations ranging from non-detect in four of the samples to 275 ppm. From these locations, three samples were also submitted for off-site fixed laboratory analysis with lead concentrations ranging from 14.0 mg/kg to 183.0 mg/kg. Five discrete XRF confirmation soil samples were collected from DU- 10 with lead concentrations ranging from non-detect in one sample to 70 ppm. From these locations, one sample was submitted for off-site fixed laboratory analysis with a lead concentrations of 37.9 mg/kg. Sixty-one discrete XRF confirmation samples were collected from Harrier Creek Road. Lead concentrations from the road samples ranged from non-detect in 13 of the samples to 305 ppm. Of these 16 samples (DUR-25-0 through DUR-40-0) were collected after all excavation and



impoundment activities were conducted, with lead concentrations ranging from non-detect in one sample to 69 ppm. Twenty discrete XRF confirmation samples were collected from the west side of the impoundment perimeter with lead concentrations ranging from non-detect in three samples to 273 ppm. Twenty-five discrete XRF confirmation samples were collected from the east side of the impoundment perimeter with lead concentrations ranging from non-detect in six samples to 397 ppm. Finally, 75 discrete XRF confirmation samples were collected from the surface of the impoundment after capping with lead concentrations ranging from non-detect in 61 samples to 125 ppm. Lead concentrations ranged from below detection limits to 397 ppm.

## **6.5 Cover Sampling**

Cover materials were sampled every 5,000 cubic yards prior to placement on the tailings impoundment. Samples were analyzed via XRF and stored on-site throughout placement of all cover materials. Discrete cover soil sample results are presented in Table 5-1. Arsenic and cadmium concentrations were below detection limits for all samples collected. Lead concentrations ranged from below detection limits to 110 ppm, with an average of 22.9 ppm. Zinc concentrations ranged from 33 ppm to 486 ppm, with an average of 119 ppm.

## **6.6 Final Inspection**

A final inspection will be conducted by EPA, the State of Washington, and Colville Indian Tribe in 2016.

## **7.0 SUMMARY OF MAINTENANCE AND REPAIR**

With the removal of Site contaminants above the specified cleanup levels, maintenance and repair (M&R) at the Site will be minimal. Primary M&R will be to ensure integrity of the cover (on- and off-impoundment), erosion control, and revegetation (i.e. vegetation

is functioning properly without undue erosion). Integrity of the tailings impoundment fencing will be maintained. Additional details are described in the Maintenance and Repair Plan.

## **8.0 CHALLENGES AND CHANGES MADE**

Overall the project schedule was shortened and costs increased by 5%. Cost increases were:

- Adverse excavation conditions: Excavation in heavily treed areas required full removal of trees, or precise excavation using smaller equipment to preserve old growth. This slowed excavation times;
- Areas of deeper than expected contamination in two locations: slough area east and west of Goldfield Mine Road and tailings north and south of Harrier Creek Road;
- Demolition of the barn building: Following further investigation during the Removal Action, it was determined that the barn building in the mill area needed to be demolished.

## **9.0 PROTECTIVENESS**

The Site meets all of the requirements specified in OSWER Directive 9320.2-09-A-P, Close Out procedures for National Priorities List Sites. Specifically, confirmatory sampling verifies that the Site has achieved the Action Memorandum cleanup objective, that the majority of contaminated materials have been removed to levels below 250 ppm for lead, and that all cleanup actions specified in the Action Memorandum have been implemented. Confirmatory sampling and tailings impoundment cover provides additional assurance that the Site no longer poses any threats to human health or the environment.

## **10.0 SITE CONTACT INFORMATION**

## **Consulting Project Manager**

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## **11.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONAL**

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”



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Jim Fricke – RMC Project Manager

## **12.0 REFERENCES**

Ecology and Environment, Inc. (E & E.), 2002, Preliminary Assessments/Site Inspections Report: Upper Columbia River Mines and Mills, Stevens County, Washington, prepared for United States Environmental Protection Agency

Ecology and Environment, Inc. (E & E.), 2013, Sierra Zinc Mine and Mill Removal Site Evaluation, Northport, Washington, prepared for United States Environmental Protection Agency

Resource Management Consultants, Inc., (RMC), 2014a, Removal Work Plan for Sierra Zinc Mine and Mill, EPA ID WAN001002396.

Resource Management Consultants, Inc., (RMC), 2014b, Quality Assurance Project Plan for Sierra Zinc Mine and Mill, EPA ID WAN001002396. Included as Appendix A in Removal Work Plan (2014a)

Resource Management Consultants, Inc., (RMC), 2015a, Site Specific Sampling Plan for Sierra Zinc Mine and Mill, EPA ID WAN001002396.

Resource Management Consultants, Inc., (RMC), 2015b, Data Quality and Assurance Review for Sierra Zinc Mine and Mill, EPA ID WAN001002396.

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United States Environmental protection Agency (USEPA), 2014b, Action Memorandum for the Sierra Zinc Mine and Mill located near Colville, Stevens County, Washington, EPA ID WAN001002396.

United States Environmental protection Agency (USEPA), 2014a, Administrative Settlement Agreement and Order on Consent for Removal Action, EPA ID WAN001002396.



Colville

Spirit

Sierra Zinc Mine



NOTES:  
LOCATIONS NOT SURVEYED  
PRELIMINARY LOCATIONS SUBJECT TO CHANGE.



SIERRA ZINC

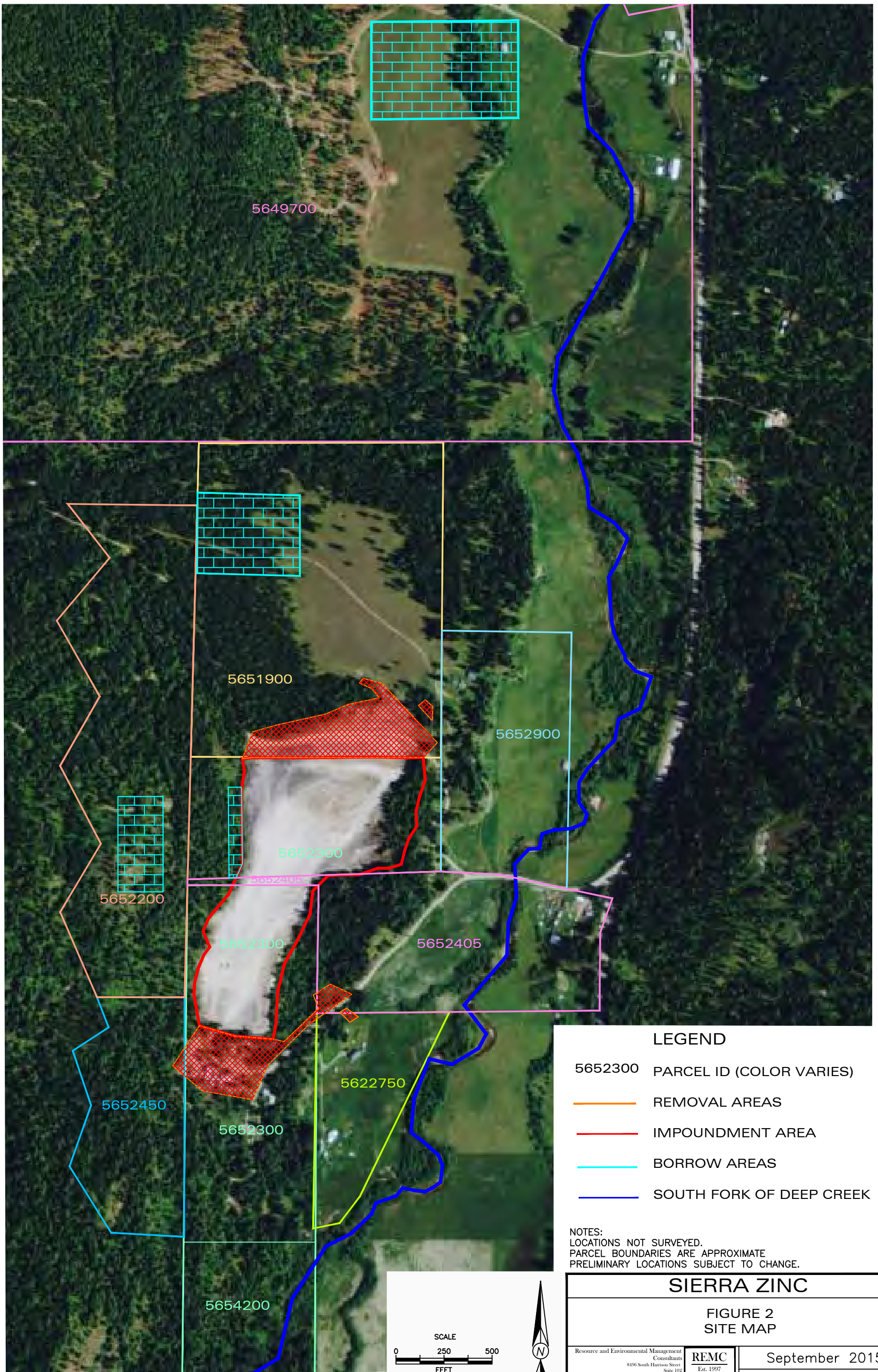
FIGURE 1  
SITE LOCATION MAP

Resource and Environmental Management  
Consultants  
8496 South Harrison Street  
Suite 102  
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(801) 257-2626

**REMC**  
Est. 1997  
Midvale, Utah

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Completion Report Figure 1.dwg





**LEGEND**

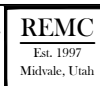
- 5652300 PARCEL ID (COLOR VARIES)
- REMOVAL AREAS
- IMPOUNDMENT AREA
- BORROW AREAS
- SOUTH FORK OF DEEP CREEK

NOTES:  
 LOCATIONS NOT SURVEYED.  
 PARCEL BOUNDARIES ARE APPROXIMATE  
 PRELIMINARY LOCATIONS SUBJECT TO CHANGE.

**SIERRA ZINC**

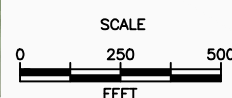
**FIGURE 2  
 SITE MAP**

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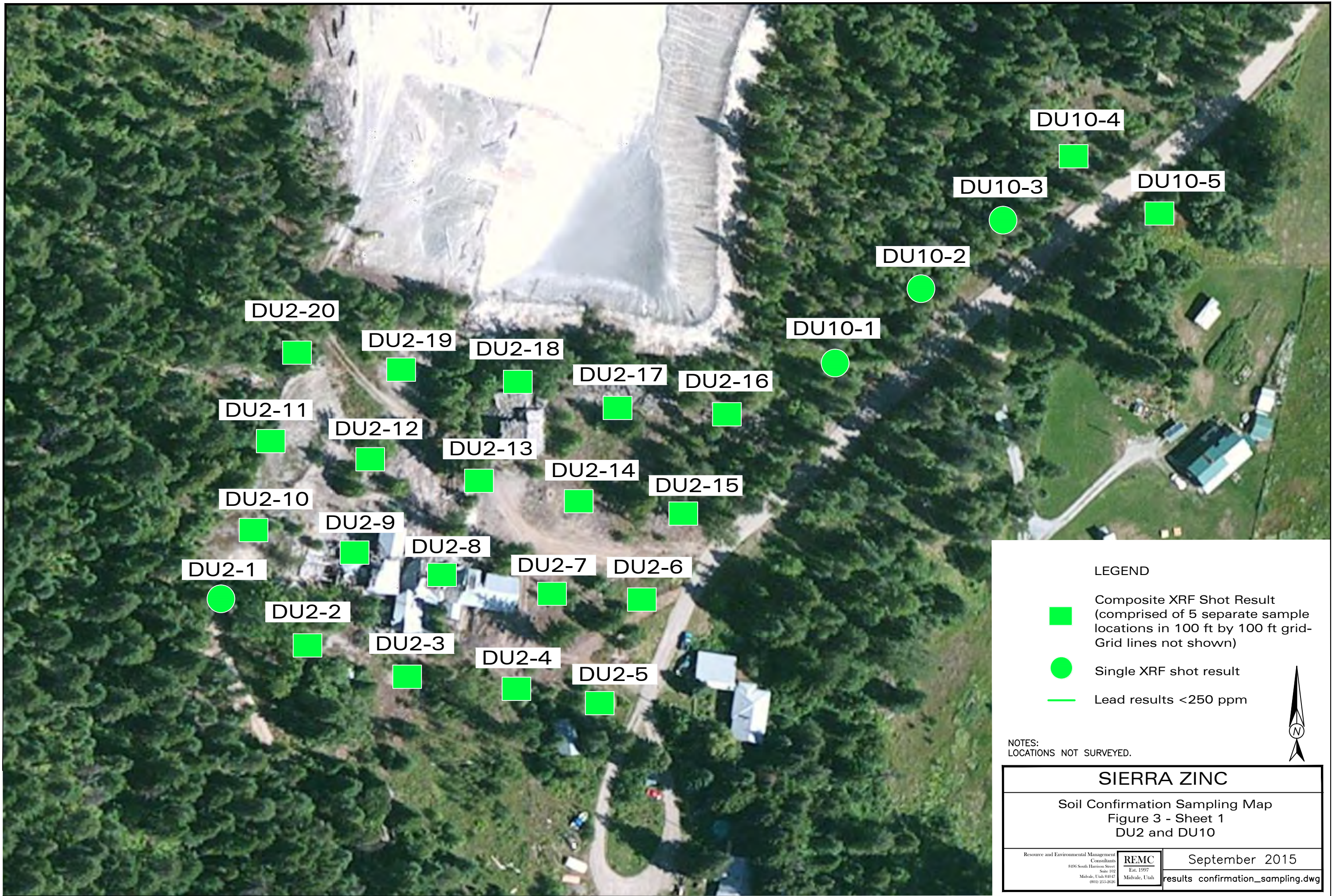


September 2015

Completion Report figure 2.dwg







DU2-20  
 DU2-19  
 DU2-18  
 DU2-17  
 DU2-16  
 DU2-11  
 DU2-12  
 DU2-13  
 DU2-14  
 DU2-15  
 DU2-10  
 DU2-9  
 DU2-8  
 DU2-7  
 DU2-6  
 DU2-1  
 DU2-2  
 DU2-3  
 DU2-4  
 DU2-5

DU10-4  
 DU10-3  
 DU10-5  
 DU10-2  
 DU10-1

LEGEND

- Composite XRF Shot Result  
(comprised of 5 separate sample locations in 100 ft by 100 ft grid-Grid lines not shown)
- Single XRF shot result
- Lead results < 250 ppm



NOTES:  
LOCATIONS NOT SURVEYED.

<b>SIERRA ZINC</b>	
Soil Confirmation Sampling Map Figure 3 - Sheet 1 DU2 and DU10	
Resource and Environmental Management Consultants 8496 South Harrison Street Suite 102 Midvale, Utah 84047 (801) 255-2626	 <b>REMC</b> Est. 1997 Midvale, Utah
September 2015	
results_confirmation_sampling.dwg	



LEGEND

□ Composite XRF Shot Result  
(comprised of 5 separate sample  
locations homogenized and then  
shot with the XRF)

■ Lead results <250 ppm

■ Lead values 250-400 ppm



NOTES:  
LOCATIONS NOT SURVEYED.

SIERRA ZINC

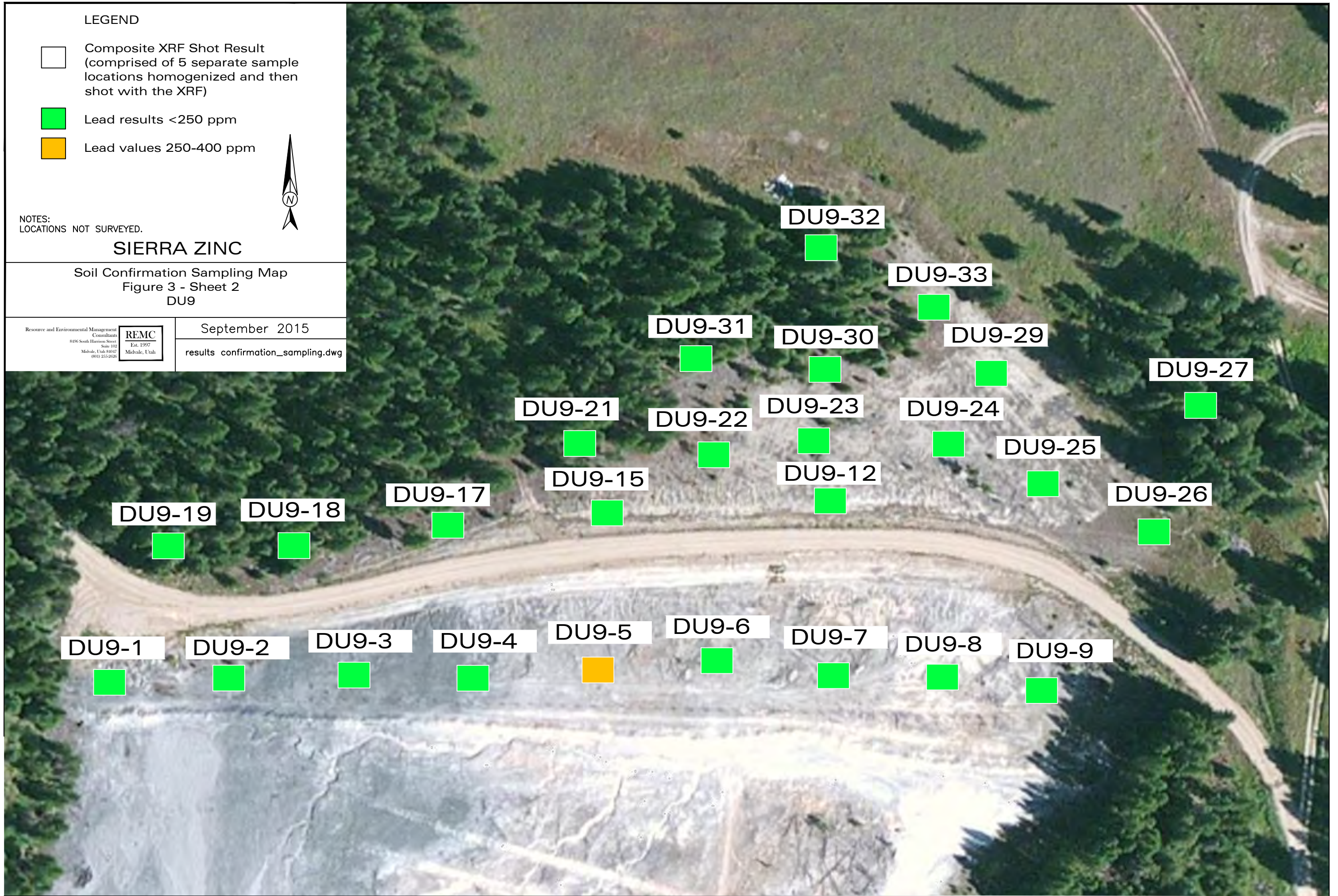
Soil Confirmation Sampling Map  
Figure 3 - Sheet 2  
DU9

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DU9-1 ■ DU9-2 ■ DU9-3 ■ DU9-4 ■ DU9-5 ■ DU9-6 ■ DU9-7 ■ DU9-8 ■ DU9-9 ■

DU9-19 ■ DU9-18 ■

DU9-17 ■

DU9-15 ■

DU9-21 ■

DU9-22 ■

DU9-23 ■

DU9-24 ■

DU9-25 ■

DU9-26 ■

DU9-27 ■

DU9-31 ■

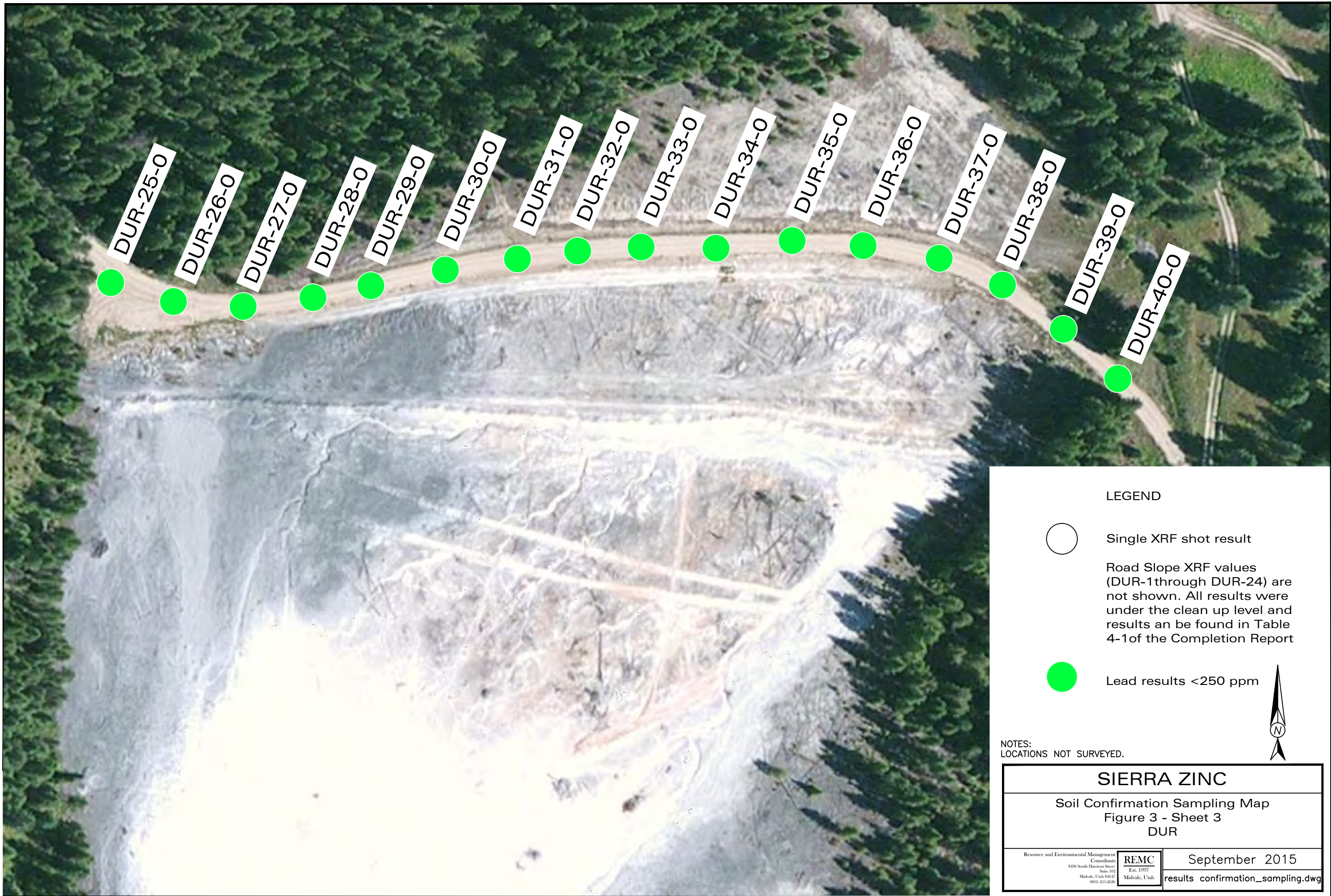
DU9-30 ■

DU9-33 ■

DU9-29 ■

DU9-32 ■





**LEGEND**



Single XRF shot result


Road Slope XRF values (DUR-1 through DUR-24) are not shown. All results were under the clean up level and results can be found in Table 4-1 of the Completion Report



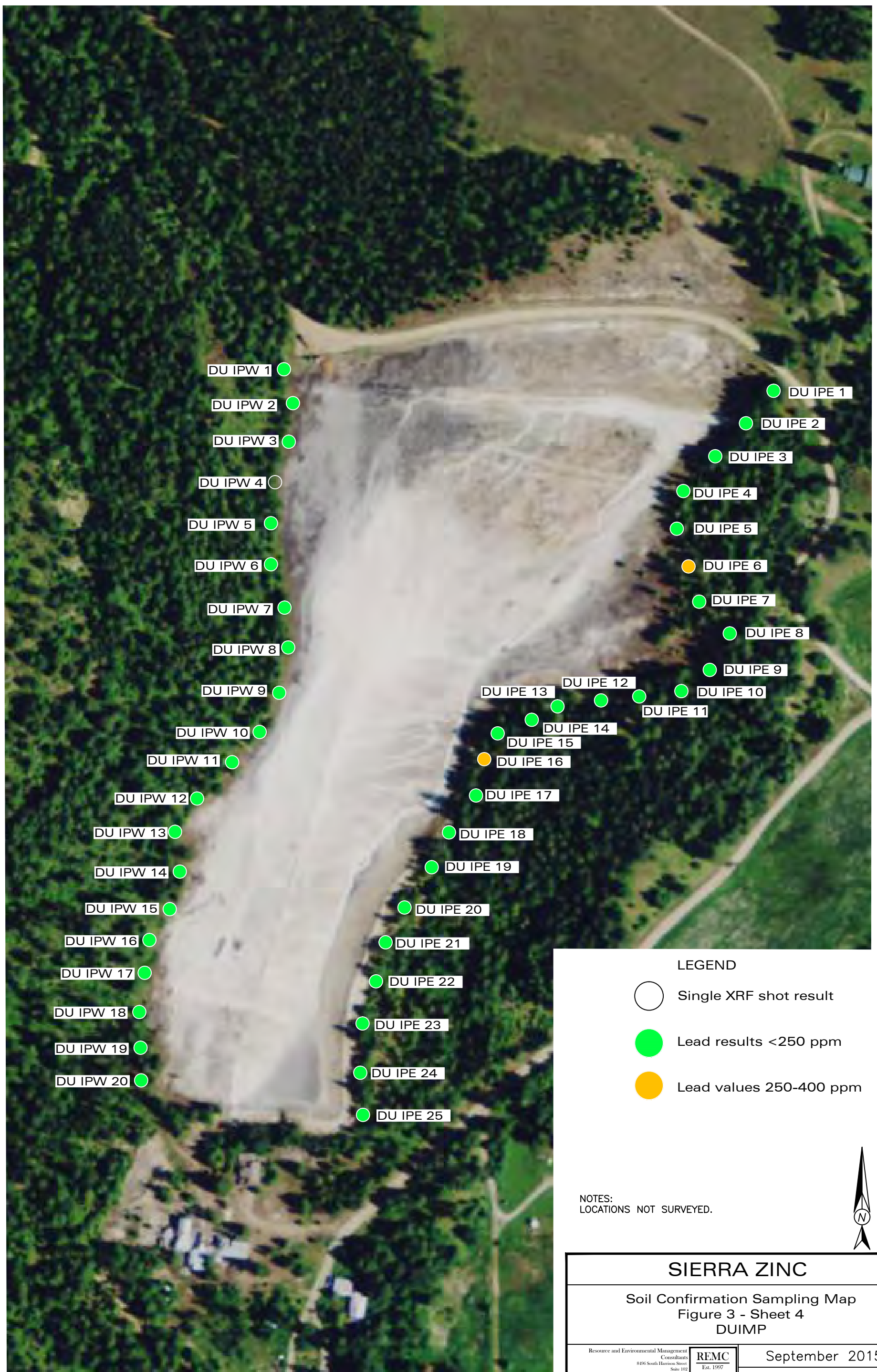
Lead results < 250 ppm



NOTES:  
LOCATIONS NOT SURVEYED.

<b>SIERRA ZINC</b>	
Soil Confirmation Sampling Map Figure 3 - Sheet 3 DUR	
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DU IPW 1 ●

DU IPW 2 ●

DU IPW 3 ●

DU IPW 4 ○

DU IPW 5 ●

DU IPW 6 ●

DU IPW 7 ●

DU IPW 8 ●

DU IPW 9 ●

DU IPW 10 ●

DU IPW 11 ●

DU IPW 12 ●

DU IPW 13 ●

DU IPW 14 ●

DU IPW 15 ●

DU IPW 16 ●

DU IPW 17 ●

DU IPW 18 ●

DU IPW 19 ●

DU IPW 20 ●

DU IPE 1 ●

DU IPE 2 ●

DU IPE 3 ●

DU IPE 4 ●

DU IPE 5 ●

DU IPE 6 ●

DU IPE 7 ●

DU IPE 8 ●

DU IPE 9 ●

DU IPE 10 ●

DU IPE 11 ●

DU IPE 13 ●

DU IPE 12 ●

DU IPE 14 ●

DU IPE 15 ●

DU IPE 16 ●

DU IPE 17 ●

DU IPE 18 ●

DU IPE 19 ●

DU IPE 20 ●

DU IPE 21 ●

DU IPE 22 ●

DU IPE 23 ●

DU IPE 24 ●

DU IPE 25 ●

LEGEND

○ Single XRF shot result

● Lead results <250 ppm

● Lead values 250-400 ppm

NOTES:  
LOCATIONS NOT SURVEYED.



SIERRA ZINC

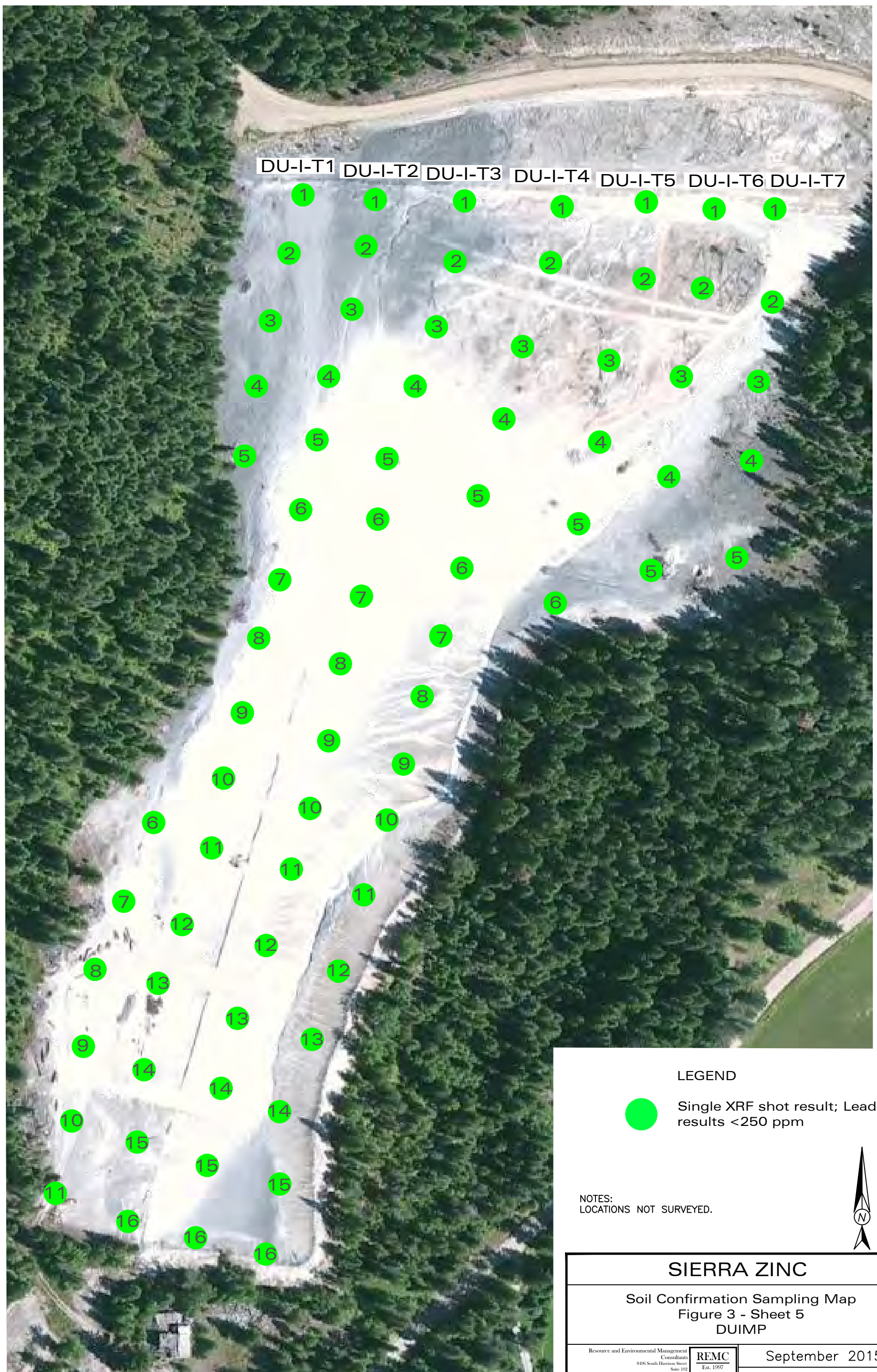
Soil Confirmation Sampling Map  
Figure 3 - Sheet 4  
DUIMP

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DU-I-T1 DU-I-T2 DU-I-T3 DU-I-T4 DU-I-T5 DU-I-T6 DU-I-T7

LEGEND

 Single XRF shot result; Lead results <250 ppm

NOTES:  
LOCATIONS NOT SURVEYED.



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Soil Confirmation Sampling Map  
Figure 3 - Sheet 5  
DUIMP

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LEGEND

- Surface Water Sample Location
- South Fork of Deep Creek

NOTES:  
LOCATIONS NOT SURVEYED.



NOT TO SCALE

SIERRA ZINC

FIGURE 4  
Surface Water Sample Locations

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TABLE 1 : Air Sample Results Summary

Upwind Air Samples				
Sample Name	Sample Location	Date Sampled	Units	Sample Result
SZ-A-01	Nixon House	10/13/2014	µg/m <sup>3</sup>	<0.13
SZ-A-02	Silt fence east of decon pad	10/13/2014	µg/m <sup>3</sup>	<0.13
SZ-A-03	orange exclusion fence	10/13/2014	µg/m <sup>3</sup>	<0.13
SZ-AR-1-10162014	Silt fence east of decon pad	10/16/2014	µg/m <sup>3</sup>	<0.092
SZ-AR-2-10162014	Nixon House	10/16/2014	µg/m <sup>3</sup>	<0.094
SZ-AR-4-10162014	Tree near construction entrance	10/16/2014	µg/m <sup>3</sup>	<0.00208
SZ-AR-1-10202014	Silt fence east of decon pad	10/20/2014	µg/m <sup>3</sup>	<0.00128
SZ-AR-2-10202014	Nixon House	10/202014	µg/m <sup>3</sup>	<0.00127
SZ-AR-3-10202014	crusher building	10/20/2014	µg/m <sup>3</sup>	<0.00199
SZ-AR-4-10202014	Tree near construction entrance	10/202014	µg/m <sup>3</sup>	<0.00139
SZ-AR-1-10212014	Silt fence east of decon pad	10/21/2014	µg/m <sup>3</sup>	<0.00112
SZ-AR-2-10212014	Nixon House	10/21/2014	µg/m <sup>3</sup>	<0.0011
# 2 Nixon Fence	Nixon House	10/30/2014	µg/m <sup>3</sup>	<0.00167
#1 Nixon Fence	Nixon House - east of Goldfiled Mine Rd	11/5/2014	µg/m <sup>3</sup>	<0.00163
# 2 Museum Fence	West of Goldfiled mine orad - Granny's house	11/5/2014	µg/m <sup>3</sup>	<0.00163
# 3 Water tower	Water tower on staggng area	11/5/2014	µg/m <sup>3</sup>	<0.00163
SZ-AR-2-11112014	West of Goldfiled mine orad - Granny's house	11/11/2014	µg/m <sup>3</sup>	<0.00072
SZ-AR-3-11112014	Maple Tree ner Nixon House - West of GFMR	11/11/2014	µg/m <sup>3</sup>	<0.00087
SZ-AR-1-5182015	Nixon tree – east of Goldfield Mine Road	5/18/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-2-5182015	Telephone pole – west of Goldfield Mine Road	5/18/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-1-5192015	Nixon property – northeast corner of fence	5/19/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-5202015	Nixon Property – NE corner of fence	5/20/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-3-5202015	Southwest corner of Site – near grease shed	5/20/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-1-5272015	Nixon House - east of Goldfiled Mine Rd	5/27/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-5272015	Southwest corner of Site	5/27/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-1-6032015	Northeast corner of Nixon Fence – Granny's house	6/3/2015	µg/m <sup>3</sup>	<0.00013

TABLE 1 : Air Sample Results Summary

Upwind Air Samples				
Sample Name	Sample Location	Date Sampled	Units	Sample Result
SZ-AR-1-6042015	Northeast corner of Nixon Fence – Granny's house	6/4/2015	µg/m <sup>3</sup>	<0.00013
SZ-AR-1-6082015	Northeast corner of Nixon Fence – Granny's house	6/8/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-1-6092015	Northeast corner of Nixon Fence – Granny's house	6/9/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-1-6102015	Northeast corner of Nixon Fence – Granny's house	6/10/2015	µg/m <sup>3</sup>	<0.00013
SZ-AR-1-6112015	Northeast corner of Nixon Fence – Granny's house	6/11/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-1-6162015	Northeast corner of Nixon Fence – Granny's house	6/16/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-1-6172015	Northeast corner of Nixon Fence – Granny's house	6/17/2015	µg/m <sup>3</sup>	Air samples damaged during shipping
SZ-AR-1-6182015	Northeast corner of Nixon Fence – Granny's house	6/18/2015	µg/m <sup>3</sup>	Air samples damaged during shipping
SZ-AR-1-6232015	Northeast corner of Nixon Fence – Granny's house	6/23/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-2-6252015	North side of Harrier Creek Road – No trespassing signs	6/25/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-1-6302015	Northwest corner of Nixon Fence – Granny's house	6/30/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-1-7082015	Northwest corner of Nixon Fence – Granny's house	7/8/2015	µg/m <sup>3</sup>	<0.00018
SZ-AR-1-7232015	Northeast corner of Nixon Fence – Granny's house	7/23/2015	µg/m <sup>3</sup>	<0.00015

TABLE 1 : Air Sample Results Summary

Work Area Air Samples				
Sample Name	Sample Location	Date Sampled	Units	Sample Result
SZ-AR-3-10162014	Personnel - water truck driver	10/16/2014	µg/m <sup>3</sup>	<0.0011
SZ-AR-3-10212014	wooden beams on impoundment	10/21/2014	µg/m <sup>3</sup>	<0.00117
#1 D6 Dozer	Personnel - equipment	10/30/2014	µg/m <sup>3</sup>	<0.00167
# 3 Silt Fence	wooden beams on impoundment	10/30/2014	µg/m <sup>3</sup>	<0.00165
SZ-AR-1-11112014	Personnel - equipment	11/11/2014	µg/m <sup>3</sup>	<0.00072
SZ-AR-2-11122014	NE cprner of tilaings impoundment	11/12/2014	µg/m <sup>3</sup>	<0.00073
SZ-AR-3-11122014	northwest corner of tailings impoundment	11/12/2014	µg/m <sup>3</sup>	<0.00076
SZ-AR-2-11172014	NE cprner of tilaings impoundment	11/17/2014	µg/m <sup>3</sup>	<0.0008
SZ-AR-3-11172014	northwest corner of tailings impoundment	11/17/2014	µg/m <sup>3</sup>	<0.0008
SZ-AR-2-11182014	NE cprner of tilaings impoundment	11/18/2014	µg/m <sup>3</sup>	<0.00079
SZ-AR-3-11182014	northwest corner of tailings impoundment	11/18/2014	µg/m <sup>3</sup>	<0.0008
SZ-AR-2-5192015	Boxed tree on center of the impoundment	5/19/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-1-5202015	Boxed tree on center of the impoundment	5/20/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-3-5272015	Boxed tree on center of the impoundment	5/27/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-5282015	Boxed tree on center of the impoundment	5/28/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-2-6012015	Boxed tree on center of the impoundment	6/1/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-3-6032015	Boxed tree on center of the impoundment	6/3/2015	µg/m <sup>3</sup>	<0.00013
SZ-AR-2-6042015	Boxed tree on center of the impoundment	6/4/2015	µg/m <sup>3</sup>	<0.00013
SZ-AR-2-6082015	Boxed tree on center of the impoundment	6/8/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-2-6092015	Boxed tree on center of the impoundment	6/9/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-2-6102015	Boxed tree on center of the impoundment	6/10/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-6112015	Boxed tree on center of the impoundment	6/11/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-3-6162015	Dozer – exterior railing	6/16/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-6232015	Eastern perimeter of the impoundment	6/23/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-1-7152015	Southern perimiter of impoundment	7/15/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-2-7232015	North end of eco-barrier borrow location	7/23/2015	µg/m <sup>3</sup>	<0.00014

TABLE 1 : Air Sample Results Summary

Downwind Area Samples				
Sample Name	Sample Location	Date Sampled	Units	Sample Result
SZ-AR-1-11122014	Jess Arrington's Fence	11/11/2014	µg/m <sup>3</sup>	<0.00072
SZ-AR-1-11172014	Jess Arrington's Fence	11/17/2014	µg/m <sup>3</sup>	<0.0008
SZ-AR-1-11182014	Jess Arrington's Fence	11/18/2014	µg/m <sup>3</sup>	<0.00078
SZ-AR-1-5282015	Northeast corner of Site - Arrington Fence	5/28/2015	µg/m <sup>3</sup>	<b>0.00017</b>
SZ-AR-1-6012015	Northeast corner of Site – Arrington Fence	6/1/2015	µg/m <sup>3</sup>	<b>0.00016</b>
SZ-AR-2-6032015	Northeast corner of Site - Arrington fence post	6/3/2015	µg/m <sup>3</sup>	<0.00013
SZ-AR-3-6042015	Northeast corner of Site - Arrington fence post	6/4/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-3-6082015	Northeast corner of Site - Arrington fence post	6/8/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-3-6092015	Northeast corner of Site - Arrington fence post	6/9/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-3-6102015	Tree along road to borrow material	6/10/2015	µg/m <sup>3</sup>	<0.00015
SZ-AR-3-6112015	Northeast corner of Site - Arrington fence post	6/11/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-6162015	Northeast corner of Site - Arrington fence post	6/16/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-6182015	Tree north of impoundment and west of borrow road	6/18/2015	µg/m <sup>3</sup>	Air samples damaged during shipping
SZ-AR-1-6252015	Northwest corner of Site - Arrington fence post	6/25/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-6302015	North of impoundment – Arrington fence post	6/30/2015	µg/m <sup>3</sup>	<0.00014
SZ-AR-2-7082015	North of impoundment – Arrington fence post	7/8/2015	µg/m <sup>3</sup>	<0.00018
SZ-AR-2-7152015	North of impoundment – Arrington fence post	7/15/2015	µg/m <sup>3</sup>	<0.00015

Notes:

Bold type indicates the sample result is above the method detection limit.







TABLE 2: Surface Water Sample Results Summary

	SAMPLE NAME	Aquatic Life Fresh Acute Ch. 173 201A WAC	Aquatic Life Fresh Acute Clean Water ACT sec 304	Aquatic Life Fresh Acute Nat'l Toxics Rule 40 CFR 13	Aquatic Life Fresh Chronic Clean 173 201A WAC	Aquatic Life Fresh Chronic Clean Water Act sec304	Aquatic Life Fresh Chronic Nat'l Toxics Rule 40 CFR 131	SZ-Adit- 10142014	SZ-DC UP- 10142014	SZ-DC Down- 10142014	SZ-DC Down 05- 10142014	SZ-Adit-5262015	SZ-Adit- 05- 5262015	SZ-Adit-7132015	SZ-Adit- 05- 7132015	SZ-DC UP- 09152015	SZ-DC UP 05- 09152015	SZ-DC Down 09152015
	SAMPLE LOCATION							Adit	Deep Creek Upstream of water station	Deep Creek downstream of water station	Deep Creek downstream of water station	Adit	Adit	Adit	Adit	Deep Creek Upstream of water station	Deep Creek Upstream of water station	Deep Creek downstream of water station
	DATA COLLECTED BY:							RMC	RMC	RMC	RMC	RMC	RMC	RMC	RMC	RMC	RMC	RMC
	DATE SAMPLED							10/15/2014	10/15/2014	10/15/2014	10/15/2014	5/26/2015	5/26/2015	7/13/2015	7/13/2015	9/15/2015	9/15/2015	9/15/2015
	UNITS							ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Vanadium	V (T)	NA	NA	NA	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	V (D)							<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	V (DL)							1	1	1	1	1	1	1	1	1	1	1
Zinc	Zn (T)	35.36	120	110	32.29	120	100	<b>502</b>	<5.0	<5.0	<5.0	<b>305</b>	<b>308</b>	<b>473</b>	<b>475</b>	<5.0	<5.0	<5.0
	Zn (D)							<b>494</b>	<b>6.1</b>	<5.0	<5.0	<b>296</b>	<b>293</b>	<b>423</b>	<b>396</b>	<5.0	<5.0	<5.0
	Zn (DL)							5	5	5	5	5	5	5	5	5	5	5

Bold type indicates the sample result is above the method detection limit.

Key:  
 A hardness value of 100 milligrams per liter is assumed.  
 D = Dissolved  
 DL = Laboratory Detection Limit  
 ND = Not detected.  
 T = Total  
 µg/L = milligrams per liter.

TABLE 3-1: Unknown Barrel Analytical Results Summary

Sample Name (Laboratory ID)			
Barrel#2 (1435008001)			
Parameter	Result	Unit	Analytical Method
Ignitability (Flashpoint)	<2.2	mm/sec	SW 1030
pH	11	pH	SW 9045
Reactive Cyanide	<0.25	ug/g	EPA 7.3.3.2
Reactive Sulfide	<50.	ug/g	EPA 7.3.4.2
Vinyl chloride	<0.0050	mg/L	SW 8260 SPLP/TCLP
1,1-Dichloroethene	<0.0050	mg/L	SW 8260 SPLP/TCLP
Methyl ethyl ketone	0.014	mg/L	SW 8260 SPLP/TCLP
Chloroform	<0.0050	mg/L	SW 8260 SPLP/TCLP
1,2-Dichloroethane	<0.0050	mg/L	SW 8260 SPLP/TCLP
Carbon tetrachloride	<0.0050	mg/L	SW 8260 SPLP/TCLP
Benzene	<0.0050	mg/L	SW 8260 SPLP/TCLP
Trichloroethene	<0.0050	mg/L	SW 8260 SPLP/TCLP
Tetrachloroethene	<0.0050	mg/L	SW 8260 SPLP/TCLP
Chlorobenzene	<0.0050	mg/L	SW 8260 SPLP/TCLP
Oxidizer (Potassium iodide)	ND		Physical Property
Arsenic	<0.270	mg/L	SW 6010C SPLP/TCLP
Barium	1.36	mg/L	SW 6010C SPLP/TCLP
Cadmium	<0.00900	mg/L	SW 6010C SPLP/TCLP
Chromium	<0.0180	mg/L	SW 6010C SPLP/TCLP
Lead	<0.0900	mg/L	SW 6010C SPLP/TCLP
Selenium	<0.270	mg/L	SW 6010C SPLP/TCLP
Silver	<0.0180	mg/L	SW 6010C SPLP/TCLP
Mercury	<0.00020	mg/L	SW 7470 SPLP/TCLP
Aroclor 1221	<0.033	ug/g	SW 8082
Aroclor 1232	<0.013	ug/g	SW 8082
Aroclor 1016	<0.011	ug/g	SW 8082
Aroclor 1242	<0.0099	ug/g	SW 8082
Aroclor 1248	<0.011	ug/g	SW 8082
Aroclor 1254	<0.011	ug/g	SW 8082
Aroclor 1260	<0.011	ug/g	SW 8082
Aroclor 1262	<0.015	ug/g	SW 8082
Aroclor 1268	<0.012	ug/g	SW 8082
Water Miscibility	ND	g/mL	Physical Property
gamma-BHC	<0.00020	mg/L	SW 8081 SPLP/TCLP
Heptachlor	<0.00020	mg/L	SW 8081 SPLP/TCLP
Heptachlor epoxide	<0.00020	mg/L	SW 8081 SPLP/TCLP
gamma-Chlordane	<0.00020	mg/L	SW 8081 SPLP/TCLP
alpha-Chlordane	<0.00020	mg/L	SW 8081 SPLP/TCLP
Endrin	<0.00020	mg/L	SW 8081 SPLP/TCLP
Methoxychlor	<0.00020	mg/L	SW 8081 SPLP/TCLP
Toxaphene	<0.10	mg/L	SW 8081 SPLP/TCLP
Pyridine	<0.050	mg/L	SW 8270 SPLP/TCLP
1,4-Dichlorobenzene	<0.050	mg/L	SW 8270 SPLP/TCLP
2-Methylphenol	<0.050	mg/L	SW 8270 SPLP/TCLP
Hexachloroethane	<0.050	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene	<0.050	mg/L	SW 8270 SPLP/TCLP
Hexachloro-1,3-butadiene	<0.050	mg/L	SW 8270 SPLP/TCLP
2,4,6-Trichlorophenol	<0.050	mg/L	SW 8270 SPLP/TCLP
2,4,5-Trichlorophenol	<0.050	mg/L	SW 8270 SPLP/TCLP
2,4-Dinitrotoluene	<0.050	mg/L	SW 8270 SPLP/TCLP
Hexachlorobenzene	<0.050	mg/L	SW 8270 SPLP/TCLP
Pentachlorophenol	<0.20	mg/L	SW 8270 SPLP/TCLP
4-Methylphenol	<0.050	mg/L	SW 8270 SPLP/TCLP
1,2-Dichloroethane-d4	0.0566	mg/L	SW 8260 SPLP/TCLP
Decachlorobiphenyl	0.00275	mg/L	SW 8081 SPLP/TCLP
2-Fluorophenol	0.272	mg/L	SW 8270 SPLP/TCLP
Tetrachloro-m-xylene	0.172	ug/g	SW 8082
Phenol-d5	0.233	mg/L	SW 8270 SPLP/TCLP
Tetrachloro-m-xylene	0.00385	mg/L	SW 8081 SPLP/TCLP
Toluene-d8	0.0528	mg/L	SW 8260 SPLP/TCLP
Nitrobenzene-d5	0.437	mg/L	SW 8270 SPLP/TCLP
4-Bromofluorobenzene	0.0508	mg/L	SW 8260 SPLP/TCLP
2-Fluorobiphenyl	0.372	mg/L	SW 8270 SPLP/TCLP
2,4,6-Tribromophenol	0.406	mg/L	SW 8270 SPLP/TCLP
Terphenyl-d14	0.432	mg/L	SW 8270 SPLP/TCLP
pH	8.05	pH	SW 9045
pH	11.4	pH	SW 9045
Reactive Sulfide	0	ug/g	EPA 7.3.4.2
Vinyl chloride	<0.005	mg/L	SW 8260 SPLP/TCLP
1,1-Dichloroethene	<0.005	mg/L	SW 8260 SPLP/TCLP
Methyl ethyl ketone	<0.005	mg/L	SW 8260 SPLP/TCLP
Chloroform	<0.005	mg/L	SW 8260 SPLP/TCLP
1,2-Dichloroethane	<0.005	mg/L	SW 8260 SPLP/TCLP
Carbon tetrachloride	<0.005	mg/L	SW 8260 SPLP/TCLP
Benzene	<0.005	mg/L	SW 8260 SPLP/TCLP
Trichloroethene	<0.005	mg/L	SW 8260 SPLP/TCLP

TABLE 3-1: Unknown Barrel Analytical Results Summary

Sample Name (Laboratory ID)			
Barrel#2 (1435008001)			
Parameter	Result	Unit	Analytical Method
Tetrachloroethene	<0.005	mg/L	SW 8260 SPLP/TCLP
Chlorobenzene	<0.005	mg/L	SW 8260 SPLP/TCLP
Arsenic	<0.27	mg/L	SW 6010C Water
Barium	<0.018	mg/L	SW 6010C Water
Cadmium	<0.009	mg/L	SW 6010C Water
Chromium	<0.018	mg/L	SW 6010C Water
Lead	<0.09	mg/L	SW 6010C Water
Selenium	<0.27	mg/L	SW 6010C Water
Silver	<0.018	mg/L	SW 6010C Water
Arsenic	<3.33	ug/L	SW 6010C SPLP/TCLP
Barium	<6.66	ug/L	SW 6010C SPLP/TCLP
Cadmium	<1.67	ug/L	SW 6010C SPLP/TCLP
Chromium	<3.33	ug/L	SW 6010C SPLP/TCLP
Lead	<3.33	ug/L	SW 6010C SPLP/TCLP
Selenium	<6.66	ug/L	SW 6010C SPLP/TCLP
Silver	<3.33	ug/L	SW 6010C SPLP/TCLP
Arsenic	<b>1890</b>	ug/L	SW 6010C SPLP/TCLP
Barium	<b>1930</b>	ug/L	SW 6010C SPLP/TCLP
Cadmium	<b>489</b>	ug/L	SW 6010C SPLP/TCLP
Chromium	<b>478</b>	ug/L	SW 6010C SPLP/TCLP
Lead	<b>1870</b>	ug/L	SW 6010C SPLP/TCLP
Selenium	<b>1890</b>	ug/L	SW 6010C SPLP/TCLP
Silver	<b>456</b>	ug/L	SW 6010C SPLP/TCLP
Mercury	<0.0001	mg/L	SW 7470 SPLP/TCLP
Mercury	<0.0001	mg/L	SW 7470 SPLP/TCLP
Mercury	<b>0.0051</b>	mg/L	SW 7470 SPLP/TCLP
Mercury	<b>0.00202</b>	mg/L	SW 7470 SPLP/TCLP
Mercury	<b>0.00206</b>	mg/L	SW 7470 SPLP/TCLP
Aroclor 1221	<0.033	ug/g	SW 8082
Aroclor 1232	<0.013	ug/g	SW 8082
Aroclor 1016	<0.011	ug/g	SW 8082
Aroclor 1242	<0.0099	ug/g	SW 8082
Aroclor 1248	<0.011	ug/g	SW 8082
Aroclor 1254	<0.011	ug/g	SW 8082
Aroclor 1260	<0.011	ug/g	SW 8082
Aroclor 1262	<0.015	ug/g	SW 8082
Aroclor 1268	<0.012	ug/g	SW 8082
Aroclor 1221	<b>1.65</b>	ug/g	SW 8082
Aroclor 1232	<b>1.44</b>	ug/g	SW 8082
Aroclor 1016	<b>1.61</b>	ug/g	SW 8082
Aroclor 1242	<b>1.54</b>	ug/g	SW 8082
Aroclor 1248	<b>1.5</b>	ug/g	SW 8082
Aroclor 1254	<b>1.63</b>	ug/g	SW 8082
Aroclor 1260	<b>1.66</b>	ug/g	SW 8082
Aroclor 1262	<b>1.17</b>	ug/g	SW 8082
Aroclor 1268	<b>1.76</b>	ug/g	SW 8082
Aroclor 1221	<b>1.65</b>	ug/g	SW 8082
Aroclor 1232	<b>1.44</b>	ug/g	SW 8082
Aroclor 1016	<b>1.59</b>	ug/g	SW 8082
Aroclor 1242	<b>1.52</b>	ug/g	SW 8082
Aroclor 1248	<b>1.48</b>	ug/g	SW 8082
Aroclor 1254	<b>1.6</b>	ug/g	SW 8082
Aroclor 1260	<b>1.62</b>	ug/g	SW 8082
Aroclor 1262	<b>1.19</b>	ug/g	SW 8082
Aroclor 1268	<b>1.7</b>	ug/g	SW 8082
gamma-BHC	<0.0002	mg/L	SW 8081 SPLP/TCLP
Heptachlor	<0.0002	mg/L	SW 8081 SPLP/TCLP
Heptachlor epoxide	<0.0002	mg/L	SW 8081 SPLP/TCLP
gamma-Chlordane	<0.0002	mg/L	SW 8081 SPLP/TCLP
alpha-Chlordane	<0.0002	mg/L	SW 8081 SPLP/TCLP
Endrin	<0.0002	mg/L	SW 8081 SPLP/TCLP
Methoxychlor	<0.0002	mg/L	SW 8081 SPLP/TCLP
Toxaphene	<0.1	mg/L	SW 8081 SPLP/TCLP
gamma-BHC	<0.0002	mg/L	SW 8081 SPLP/TCLP
Heptachlor	<0.0002	mg/L	SW 8081 SPLP/TCLP
Heptachlor epoxide	<0.0002	mg/L	SW 8081 SPLP/TCLP
gamma-Chlordane	<0.0002	mg/L	SW 8081 SPLP/TCLP
alpha-Chlordane	<0.0002	mg/L	SW 8081 SPLP/TCLP
Endrin	<0.0002	mg/L	SW 8081 SPLP/TCLP
Methoxychlor	<0.0002	mg/L	SW 8081 SPLP/TCLP
Toxaphene	<0.1	mg/L	SW 8081 SPLP/TCLP
gamma-BHC	<b>0.00468</b>	mg/L	SW 8081 SPLP/TCLP
Heptachlor	<b>0.0055</b>	mg/L	SW 8081 SPLP/TCLP
Heptachlor epoxide	<b>0.00483</b>	mg/L	SW 8081 SPLP/TCLP
gamma-Chlordane	<b>0.00462</b>	mg/L	SW 8081 SPLP/TCLP
alpha-Chlordane	<b>0.00453</b>	mg/L	SW 8081 SPLP/TCLP
Endrin	<b>0.00512</b>	mg/L	SW 8081 SPLP/TCLP
Methoxychlor	<b>0.00667</b>	mg/L	SW 8081 SPLP/TCLP

TABLE 3-1: Unknown Barrel Analytical Results Summary

Sample Name (Laboratory ID)			
Barrel#2 (1435008001)			
Parameter	Result	Unit	Analytical Method
gamma-BHC	<b>0.00473</b>	mg/L	SW 8081 SPLP/TCLP
Heptachlor	<b>0.00554</b>	mg/L	SW 8081 SPLP/TCLP
Heptachlor epoxide	<b>0.00486</b>	mg/L	SW 8081 SPLP/TCLP
gamma-Chlordane	<b>0.00464</b>	mg/L	SW 8081 SPLP/TCLP
alpha-Chlordane	<b>0.00463</b>	mg/L	SW 8081 SPLP/TCLP
Endrin	<b>0.00518</b>	mg/L	SW 8081 SPLP/TCLP
Methoxychlor	<b>0.00682</b>	mg/L	SW 8081 SPLP/TCLP
Pyridine	<0.05	mg/L	SW 8270 SPLP/TCLP
1,4-Dichlorobenzene	<0.05	mg/L	SW 8270 SPLP/TCLP
2-Methylphenol	<0.05	mg/L	SW 8270 SPLP/TCLP
Hexachloroethane	<0.05	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene	<0.05	mg/L	SW 8270 SPLP/TCLP
Hexachloro-1,3-butadiene	<0.05	mg/L	SW 8270 SPLP/TCLP
2,4,6-Trichlorophenol	<0.05	mg/L	SW 8270 SPLP/TCLP
2,4,5-Trichlorophenol	<0.05	mg/L	SW 8270 SPLP/TCLP
2,4-Dinitrotoluene	<0.05	mg/L	SW 8270 SPLP/TCLP
Hexachlorobenzene	<0.05	mg/L	SW 8270 SPLP/TCLP
Pentachlorophenol	<0.2	mg/L	SW 8270 SPLP/TCLP
4-Methylphenol	<0.05	mg/L	SW 8270 SPLP/TCLP
Pyridine	<0.005	mg/L	SW 8270 SPLP/TCLP
1,4-Dichlorobenzene	<0.005	mg/L	SW 8270 SPLP/TCLP
2-Methylphenol	<0.005	mg/L	SW 8270 SPLP/TCLP
Hexachloroethane	<0.005	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene	<0.005	mg/L	SW 8270 SPLP/TCLP
Hexachloro-1,3-butadiene	<0.005	mg/L	SW 8270 SPLP/TCLP
2,4,6-Trichlorophenol	<0.005	mg/L	SW 8270 SPLP/TCLP
2,4,5-Trichlorophenol	<0.005	mg/L	SW 8270 SPLP/TCLP
2,4-Dinitrotoluene	<0.005	mg/L	SW 8270 SPLP/TCLP
Hexachlorobenzene	<0.005	mg/L	SW 8270 SPLP/TCLP
Pentachlorophenol	<0.02	mg/L	SW 8270 SPLP/TCLP
4-Methylphenol	<0.005	mg/L	SW 8270 SPLP/TCLP
Pyridine	<b>0.0139</b>	mg/L	SW 8270 SPLP/TCLP
1,4-Dichlorobenzene	<b>0.024</b>	mg/L	SW 8270 SPLP/TCLP
2-Methylphenol	<b>0.0302</b>	mg/L	SW 8270 SPLP/TCLP
Hexachloroethane	<b>0.0249</b>	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene	<b>0.0325</b>	mg/L	SW 8270 SPLP/TCLP
Hexachloro-1,3-butadiene	<b>0.026</b>	mg/L	SW 8270 SPLP/TCLP
2,4,6-Trichlorophenol	<b>0.0319</b>	mg/L	SW 8270 SPLP/TCLP
2,4,5-Trichlorophenol	<b>0.0327</b>	mg/L	SW 8270 SPLP/TCLP
2,4-Dinitrotoluene	<b>0.0411</b>	mg/L	SW 8270 SPLP/TCLP
Hexachlorobenzene	<b>0.034</b>	mg/L	SW 8270 SPLP/TCLP
Pentachlorophenol	<b>0.0366</b>	mg/L	SW 8270 SPLP/TCLP
4-Methylphenol	<b>0.0317</b>	mg/L	SW 8270 SPLP/TCLP
Pyridine	<0.005	mg/L	SW 8270 SPLP/TCLP
1,4-Dichlorobenzene	<b>0.024</b>	mg/L	SW 8270 SPLP/TCLP
2-Methylphenol	<b>0.0309</b>	mg/L	SW 8270 SPLP/TCLP
Hexachloroethane	<b>0.0246</b>	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene	<b>0.0332</b>	mg/L	SW 8270 SPLP/TCLP
Hexachloro-1,3-butadiene	<b>0.0262</b>	mg/L	SW 8270 SPLP/TCLP
2,4,6-Trichlorophenol	<b>0.034</b>	mg/L	SW 8270 SPLP/TCLP
2,4,5-Trichlorophenol	<b>0.0352</b>	mg/L	SW 8270 SPLP/TCLP
2,4-Dinitrotoluene	<b>0.0424</b>	mg/L	SW 8270 SPLP/TCLP
Hexachlorobenzene	<b>0.0364</b>	mg/L	SW 8270 SPLP/TCLP
Pentachlorophenol	<b>0.04</b>	mg/L	SW 8270 SPLP/TCLP
4-Methylphenol	<b>0.0313</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorophenol	<b>0.289</b>	mg/L	SW 8270 SPLP/TCLP
Phenol-d5	<b>0.234</b>	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene-d5	<b>0.448</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorobiphenyl	<b>0.381</b>	mg/L	SW 8270 SPLP/TCLP
2,4,6-Tribromophenol	<b>0.438</b>	mg/L	SW 8270 SPLP/TCLP
Terphenyl-d14	<b>0.453</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorophenol	<b>0.0253</b>	mg/L	SW 8270 SPLP/TCLP
Phenol-d5	<b>0.0215</b>	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene-d5	<b>0.0424</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorobiphenyl	<b>0.0372</b>	mg/L	SW 8270 SPLP/TCLP
2,4,6-Tribromophenol	<b>0.0421</b>	mg/L	SW 8270 SPLP/TCLP
Terphenyl-d14	<b>0.0464</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorophenol	<b>0.0275</b>	mg/L	SW 8270 SPLP/TCLP
Phenol-d5	<b>0.0231</b>	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene-d5	<b>0.044</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorobiphenyl	<b>0.04</b>	mg/L	SW 8270 SPLP/TCLP
2,4,6-Tribromophenol	<b>0.0436</b>	mg/L	SW 8270 SPLP/TCLP
Terphenyl-d14	<b>0.0434</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorophenol	<b>0.0264</b>	mg/L	SW 8270 SPLP/TCLP
Phenol-d5	<b>0.0219</b>	mg/L	SW 8270 SPLP/TCLP
Nitrobenzene-d5	<b>0.0437</b>	mg/L	SW 8270 SPLP/TCLP
2-Fluorobiphenyl	<b>0.0414</b>	mg/L	SW 8270 SPLP/TCLP
2,4,6-Tribromophenol	<b>0.0457</b>	mg/L	SW 8270 SPLP/TCLP
Terphenyl-d14	<b>0.0465</b>	mg/L	SW 8270 SPLP/TCLP

Note: Bold type indicates the sample result is above the method detection limit.

TABLE 3-2: Mill Concrete SPLP Analytical Results Summary

Sample Name (Laboratory ID)			
SZ-MILL-Concrete-7152015 (10315108001)			
Parameter	Result	Unit	Analytical Method
Arsenic	ND	mg/L	EPA 6020A MET, SPLP
Barium	ND	mg/L	EPA 6020A MET, SPLP
Cadmium	ND	mg/L	EPA 6020A MET, SPLP
Chromium	<b>0.022</b>	mg/L	EPA 6020A MET, SPLP
Lead	ND	mg/L	EPA 6020A MET, SPLP
Selenium	ND	mg/L	EPA 6020A MET, SPLP
Silver	ND	mg/L	EPA 6020A MET, SPLP
Mercury	ND	µg/L	7470A Mercury, SPLP

Note: Bold type indicates the sample result is above the method detection limit.

TABLE 4-1: Confirmation Sample Results - XRF Analysis

Analyte (ppm)	Arsenic	Cadmium	Lead	Zinc
Screening Criteria	20	2	250	NA
Sample Name	XRF Results			
DU2-1*	ND	ND	17.5	47
DU2-2	ND	ND	34	538
DU2-3	ND	ND	115	77
DU2-4**	ND	ND	64	364
DU2-5**	13.6	ND	44	456
DU2-6	ND	ND	61	596
DU2-7	ND	ND	62	917
DU2-8	ND	ND	70	1143
DU2-9	ND	ND	26	151
DU2-10	ND	ND	26	125
DU2-11	ND	ND	ND	51
DU2-12	ND	ND	94	833
DU2-13	ND	ND	113	1097
DU2-14	ND	ND	124	1263
DU2-15	ND	ND	82	868
DU2-16	ND	ND	26	1483
DU2-17	ND	ND	56	267
DU2-18	ND	ND	75	578
DU2-19	ND	ND	113	601
DU2-20	ND	ND	ND	132
DU9-1	ND	ND	18	850
DU9-2	ND	ND	ND	304
DU9-3	ND	ND	147	1250
DU9-4	ND	ND	79	1045
DU9-5	ND	ND	275	1733
DU9-6	ND	ND	201	1478
DU9-7	ND	ND	149	1009
DU9-8	ND	ND	124	660
DU9-9	ND	ND	67	509
DU9-12	ND	ND	50	113
DU9-15	ND	ND	51	595
DU9-17	ND	ND	56	552
DU9-18	ND	ND	49	487
DU9-19	ND	ND	171	818
DU9-21	ND	ND	58	282
DU9-22	ND	ND	ND	330
DU9-23	ND	ND	94	725
DU9-24	ND	ND	ND	385
DU9-25	ND	ND	35	605
DU9-26	ND	ND	113	423
DU9-27	ND	ND	17	392
DU9-29	ND	ND	28	325
DU9-30	ND	ND	84	588
DU9-31	ND	ND	22	340
DU9-32	ND	ND	33	201
DU9-33	ND	ND	ND	180
DU10-1*	ND	ND	26	279
DU10-2*	ND	ND	ND	174
DU10-3*	ND	ND	22	151
DU10-4	ND	ND	70	987
DU10-5	ND	ND	25	206
DUR-1-3*	ND	ND	41	293
DUR-1-4*	ND	ND	179	1175
DUR-2-3*	ND	ND	192	710
DUR-2-4*	ND	ND	215	1432
DUR-3-3*	ND	ND	87	564
DUR-3-4*	ND	ND	289	1948
DUR-4-3*	ND	ND	36	172
DUR-4-4*	ND	ND	161	1366
DUR-5-3*	ND	ND	ND	106
DUR-5-4*	ND	ND	305	ND
DUR-6-3*	ND	ND	ND	85
DUR-7-3*	ND	ND	37	164
DUR-7-4*	ND	ND	21	91
DUR-8-4*	ND	ND	32	174
DUR-8-3*	ND	ND	ND	105
DUR-9-4*	ND	ND	134	742
DUR-9-3*	ND	ND	ND	129
DUR-10-4*	ND	ND	114	706
DUR-10-3*	ND	ND	23	175
DUR-11-3*	ND	ND	32	209
DUR-11-4*	ND	ND	134	844
DUR-12-4*	ND	ND	31	188
DUR-12-3*	ND	ND	ND	130
DUR-13-3*	ND	ND	ND	123
DUR-13-4*	ND	ND	153	699
DUR-14-4*	ND	ND	ND	113
DUR-14-3*	ND	ND	34	111
DUR-15-3*	ND	ND	69	332
DUR-16-2*	ND	ND	24	187
DUR-16-1*	ND	ND	22	146
DUR-17-1*	ND	ND	24	118
DUR-17-2*	14	ND	ND	110
DUR-18-2*	ND	ND	31	118
DUR-18-1*	ND	ND	224	954
DUR-19-2*	ND	ND	22	77
DUR-19-1*	ND	ND	23	115
DUR-20-1*	ND	ND	ND	114
DUR-20-2*	ND	ND	ND	90
DUR-21-2*	ND	ND	ND	112
DUR-21-1*	ND	ND	ND	84
DUR-22-1*	ND	ND	76	448
DUR-22-2*	ND	ND	65	25
DUR-23-2*	ND	ND	124	742
DUR-23-1*	ND	ND	222	1089
DUR-24-1*	ND	ND	53	241
DUR-25-0*	ND	ND	ND	185
DUR-26-0*	ND	ND	65	25
DUR-27-0*	ND	ND	38	120
DUR-28-0*	ND	ND	25	153
DUR-29-0*	ND	ND	23	152



TABLE 4-1: Confirmation Sample Results - XRF Analysis

Analyte (ppm)	Arsenic	Cadmium	Lead	Zinc
Screening Criteria	20	2	250	NA
Sample Name	XRF Results			
DUR-30-0*	ND	ND	38	94
DUR-31-0*	ND	ND	28	179
DUR-32-0*	ND	ND	23	147
DUR-33-0*	ND	ND	40	215
DUR-34-0*	ND	ND	36	227
DUR-35-0*	ND	ND	69	309
DUR-36-0*	ND	ND	66	311
DUR-37-0*	ND	ND	65	309
DUR-38-0*	ND	ND	33	193
DUR-39-0*	ND	ND	31	168
DUR-40-0*	ND	ND	41	198
NHCR Cover 1*	ND	ND	ND	48
NHCR Cover 2*	ND	ND	ND	46
NHCR Cover 3*	ND	ND	ND	67
NHCR Cover 4*	ND	ND	ND	39
NHCR Cover 5*	ND	ND	ND	79
DU-IPW-1*	ND	ND	217	2665
DU-IPW-2*	ND	ND	20	334
DU-IPW-3*	ND	ND	29	286
DU-IPW-4*	ND	ND	273	2556
DU-IPW-5*	ND	ND	ND	153
DU-IPW-6*	ND	ND	ND	68
DU-IPW-7*	ND	ND	93	1251
DU-IPW-8*	ND	ND	ND	178
DU-IPW-9*	ND	ND	82	619
DU-IPW-10*	ND	ND	147	1157
DU-IPW-11*	ND	ND	82	423
DU-IPW-12*	ND	ND	72	985
DU-IPW-13*	ND	ND	78	561
DU-IPW-14*	ND	ND	208	1302
DU-IPW-15*	24	ND	176	1555
DU-IPW-16*	ND	ND	25	140
DU-IPW-17*	ND	ND	158	1881
DU-IPW-18*	ND	ND	75	375
DU-IPW-19*	ND	ND	18	190
DU-IPW-20*	ND	ND	100	652
DU-IPE-1*	ND	ND	ND	100
DU-IPE-2*	ND	ND	105	264
DU-IPE-3*	ND	ND	50	289
DU-IPE-4*	ND	ND	227	867
DU-IPE-5*	ND	ND	ND	191
DU-IPE-6*	ND	ND	273	2556
DU-IPE-7*	ND	ND	35	449
DU-IPE-8*	ND	ND	164	977
DU-IPE-9*	ND	ND	ND	114
DU-IPE-10*	ND	ND	ND	83
DU-IPE-11*	ND	ND	20	73
DU-IPE-12*	ND	ND	24	111
DU-IPE-13*	ND	ND	99	499
DU-IPE-14*	ND	ND	123	573
DU-IPE-15*	26	ND	107	1145
DU-IPE-16*	ND	ND	397	1178
DU-IPE-17*	ND	ND	100	276
DU-IPE-18*	ND	ND	34	189
DU-IPE-19*	ND	ND	32	174
DU-IPE-20*	ND	ND	203	732
DU-IPE-21*	ND	ND	ND	103
DU-IPE-22*	ND	ND	31	120
DU-IPE-23*	ND	ND	193	2073
DU-IPE-24*	ND	ND	ND	81
DU-IPE-25*	ND	ND	166	3016
DU-I-T1-1*	ND	ND	ND	209
DU-I-T1-2*	ND	ND	ND	112
DU-I-T1-3*	ND	ND	ND	98
DU-I-T1-4*	ND	ND	ND	108
DU-I-T1-5*	ND	ND	ND	125
DU-I-T1-6*	ND	ND	ND	114
DU-I-T1-7*	ND	ND	ND	102
DU-I-T1-8*	ND	ND	ND	99
DU-I-T1-9*	ND	ND	ND	106
DU-I-T1-10*	20	ND	78	409
DU-I-T1-11*	ND	ND	26	137
DU-I-T2-1*	ND	ND	19	137
DU-I-T2-2*	ND	ND	22	117
DU-I-T2-3*	ND	ND	ND	94
DU-I-T2-4*	ND	ND	ND	97
DU-I-T2-5*	ND	ND	ND	88
DU-I-T2-6*	ND	ND	ND	70
DU-I-T2-7*	ND	ND	ND	94
DU-I-T2-8*	ND	ND	ND	103
DU-I-T2-9*	ND	ND	19	107
DU-I-T2-10*	ND	ND	ND	92
DU-I-T2-11*	ND	ND	ND	110
DU-I-T2-12*	ND	ND	ND	130
DU-I-T2-13*	ND	ND	ND	47
DU-I-T2-14*	ND	ND	ND	122
DU-I-T2-15*	ND	ND	ND	99
DU-I-T2-16*	ND	ND	ND	111
DU-I-T3-1*	ND	ND	ND	100
DU-I-T3-2*	ND	ND	ND	99
DU-I-T3-3*	ND	ND	125	157
DU-I-T3-4*	ND	ND	ND	119
DU-I-T3-5*	ND	ND	ND	107
DU-I-T3-6*	ND	ND	ND	77
DU-I-T3-7*	ND	ND	ND	76
DU-I-T3-8*	ND	ND	ND	110
DU-I-T3-9*	ND	ND	ND	115
DU-I-T3-10*	12	ND	ND	92
DU-I-T3-11*	ND	ND	ND	127
DU-I-T3-12*	ND	ND	ND	106
DU-I-T3-13*	ND	ND	ND	144
DU-I-T3-14*	ND	ND	ND	106
DU-I-T3-15*	ND	ND	ND	92
DU-I-T3-16*	ND	ND	ND	103

TABLE 4-1: Confirmation Sample Results - XRF Analysis

Analyte (ppm)	Arsenic	Cadmium	Lead	Zinc
Screening Criteria	20	2	250	NA
Sample Name	XRF Results			
DU-I-T4-1*	ND	ND	ND	129
DU-I-T4-2*	ND	ND	ND	116
DU-I-T4-3*	ND	ND	ND	107
DU-I-T4-4*	ND	ND	ND	84
DU-I-T4-5*	ND	ND	ND	78
DU-I-T4-6*	ND	ND	ND	91
DU-I-T4-7*	ND	ND	20	100
DU-I-T4-8*	ND	ND	ND	95
DU-I-T4-9*	ND	ND	25	103
DU-I-T4-10*	ND	ND	ND	110
DU-I-T4-11*	ND	ND	ND	99
DU-I-T4-12*	ND	ND	ND	95
DU-I-T4-13*	ND	ND	ND	121
DU-I-T4-14*	ND	ND	18	111
DU-I-T4-15*	ND	ND	ND	179
DU-I-T4-16*	ND	ND	ND	126
DU-I-T5-1*	ND	ND	ND	104
DU-I-T5-2*	ND	ND	ND	109
DU-I-T5-3*	ND	ND	ND	51
DU-I-T5-4*	ND	ND	23	110
DU-I-T5-5*	ND	ND	ND	126
DU-I-T5-6*	ND	ND	19	117
DU-I-T6-1*	ND	ND	22	91
DU-I-T6-2*	ND	ND	ND	121
DU-I-T6-3*	ND	ND	23	119
DU-I-T6-4*	ND	ND	ND	94
DU-I-T6-5*	ND	ND	ND	119
DU-I-T7-1*	ND	ND	ND	90
DU-I-T7-2*	ND	ND	22	100
DU-I-T7-3*	ND	ND	ND	93
DU-I-T7-4*	ND	ND	ND	108
DU-I-T7-5*	ND	ND	ND	103
Average Concentrations***	6.8	ND	53.8	393

Note: Only analytes described in Removal Work Plan Soil Cleanup Level listed above  
 Bold type indicates the sample result is above the method detection limit.  
 Yellow highlighted cells indicate the sample result is above the Soil Cleanup Level described in the Removal Work Plan  
 Only XRF results from the composite bag listed above; All other XRF results available upon request  
 \*Single XRF Shot taken instead of grab sample  
 \*\*Confirmation Sample collected in November 2014 prior to backfill placement requested by homeowner  
 \*\*\* Averages were calculated using 1/2 the detection limit for ND values  
 Niton XL2 500 soil detection limits: As = 13 ppm; Cd = 25 ppm; Pb = 20 ppm; Zn = 16 ppm

Key:  
 ID = Identification.  
 ppm = parts per million  
 MTCA = Model Toxics Control Act.  
 NA = There is no value for this analyte.  
 ND = Non-detect.  
 NR = There was no value reported for this analyte.  
 NS = The sample was not submitted for analysis of this analyte.  
 DU = Decision Unit  
 DUR = Decision Unit Road  
 IPE = Impoundment - East  
 IPW = Impoundment - West

TABLE 4-2: Confirmation Sample Results - Laboratory Analysis

Analyte (ppm)	Arsenic	Cadmium	Lead	Zinc
Screening Criteria	20	2	250	NA
Sample Name DU Location Laboratory Sample ID	Laboratory Results			
SZ-SO-Assay 4-11182014 DU2-4 10289747001	3.6	1.5	65.9	47.2
SZ-SO-DU2-18 DU2-18 10312517001	1.7	0.72	49.6	328
SZ-SO-DU10-5 DU10-5 10312517002	3.9	1.2	37.9	247
SZ-SO-DU2-9 DU 2-9 10317959004	1.6	0.29	45.0	70.5
SZ-SO-DU9-3 DU9-3 10317959005	1.7	0.97	68.7	771
SZ-SO-DU9-8 DU9-8 10317959006	2.1	2.2	183.0	843
SZ-SO-DU9-22 DU9-22 10317959006	0.98	0.26	14.0	255
Average Concentrations	2.2	1.0	66.3	366.0

Note: Only analytes described in Removal Work Plan Soil Cleanup Level listed above  
 Bold type indicates the sample result is above the method detection limit.  
 Yellow highlighted cells indicate the sample result is above the Soil Cleanup Level described in the Removal Work Plan

TABLE 5: Composite Samples of Cover Material - XRF Results

Analyte (ppm)			Arsenic	Cadmium	Lead	Zinc
Screening Criteria			20	2	250	NA
Sample Name	Media Type	Date Collected	XRF Results			
SZ-SO-EB-7142015	Eco-barrier	7/14/2015	ND	ND	ND	<b>293</b>
SZ-SO-EB-7152015	Eco-barrier	7/15/2015	ND	ND	ND	<b>145</b>
SZ-SO-EB-7202015	Eco-barrier	7/20/2015	ND	ND	<b>110</b>	<b>486</b>
SZ-SO-CS-7142015	Cover soils	7/14/2015	ND	ND	ND	<b>81</b>
SZ-SO-CS-7152015	Cover soils	7/15/2015	ND	ND	ND	<b>98</b>
SZ-SO-CS-7162015	Cover soils	7/16/2015	ND	ND	ND	<b>102</b>
SZ-SO-CS-7212015	Cover soils	7/21/2015	ND	ND	ND	<b>59</b>
SZ-SO-CS-7222015	Cover soils	7/22/2015	ND	ND	ND	<b>85</b>
SZ-SO-CS-7232015	Cover soils	7/23/2015	ND	ND	ND	<b>102</b>
SZ-SO-CS-7242015	Cover soils	7/24/2015	ND	ND	ND	<b>76</b>
SZ-SO-CS-7272015	Cover soils	7/27/2015	ND	ND	ND	<b>84</b>
SZ-SO-CS-7282015	Cover Soils	7/28/2015	ND	ND	<b>110</b>	<b>80</b>
SZ-SO-CS-7292015	Cover soils	7/29/2015	ND	ND	ND	<b>33</b>
SZ-SO-CS-7302015	Cover soils	7/30/2015	ND	ND	<b>19</b>	<b>94</b>
SZ-SO-CS-7312015	Cover soils	7/31/2015	ND	ND	ND	<b>74</b>
SZ-SO-TS-8052015	Top Soil	7/5/2015	ND	ND	ND	<b>92</b>
SZ-SO-TS-8072015	Top Soil	7/7/2015	ND	ND	ND	<b>78</b>
SZ-SO-TS-08122015	Top Soil	8/12/2015	ND	ND	<b>32</b>	<b>78</b>
Average Concentrations*			ND	ND	22.9	119

Note: Only analytes described in Removal Work Plan Soil Cleanup Level listed above

Bold type indicates the sample result is above the method detection limit.

\*Averages were calculated using 1/2 the detection limit for ND values

Niton XL2 500 soil detection limits: As = 13 ppm; Cd = 25 ppm; Pb = 20 ppm; Zn = 16 ppm

Key:

ID = Identification.

ppm = parts per million

ND = Non-detect.

EB = Eco-barrier

CS = Cover Soils

TS = Top Soils

## **APPENDIX A**

**Site Photos (on enclosed CD)**





































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11/11/2014 10:17





11/11/2014 15:19





11/12/2014 17:16

















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TILE-00

Clear  
Gel-Lube  
Lubricant

M & M Truck  
Maintenance, Inc.  
(253) 518-8999

































































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## **APPENDIX B**

**Laboratory Reports (on enclosed CD)**



# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Spokane  
11922 East 1st. Avenue  
Spokane, WA 99206  
Tel: (509)924-9200

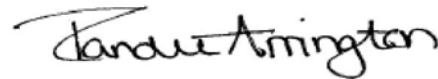
TestAmerica Job ID: SXJ0159

Client Project/Site: Sierra Zinc Mine  
Client Project Description: Sierra Zinc Mine

For:

Emerald Services Inc.  
6308 E. Sharp Ave  
Spokane Valley, WA 99212

Attn: Dave Blackham



Authorized for release by:  
11/5/2014 11:22:08 AM

Randee Arrington, Project Manager  
(509)924-9200  
[Randee.Arrington@testamericainc.com](mailto:Randee.Arrington@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Sample Summary

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
SXJ0159-01	26626-1 Grease	Other (S)	10/22/14 00:00	10/23/14 15:10

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# Definitions/Glossary

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

## Qualifiers

### Metals

Qualifier	Qualifier Description
B	Analyte was detected in the associated Method Blank.
B1	Analyte was detected in the associated method blank. Analyte concentration in the sample is greater than 10x the concentration found in the method blank.
M4	The sample required a dilution due to matrix interference. Because of this dilution, the matrix spike concentrations in the sample were reduced to a level where the recovery calculation does not provide useful information. See Blank Spike (LCS).
M2	The MS and/or MSD were below the acceptance limits due to sample matrix interference. See Blank Spike (LCS).

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
$\alpha$	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



# Client Sample Results

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

**Client Sample ID: 26626-1 Grease**

**Lab Sample ID: SXJ0159-01**

**Date Collected: 10/22/14 00:00**

**Matrix: Other (S)**

**Date Received: 10/23/14 15:10**

**Method: EPA 6010C - Metals Content by EPA 6010/7000 Series Methods, Prep by EPA 3050B**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	21.0		3.85		mg/kg wet		10/24/14 10:21	10/27/14 16:59	1.00
Nickel	4.17		1.20		mg/kg wet		10/24/14 10:21	10/28/14 13:48	1.00
Zinc	303	B1	1.92		mg/kg wet		10/24/14 10:21	10/27/14 16:59	1.00

**Method: EPA 6010C - TCLP Metals by EPA 1311/6010/7000 Series Methods - TCLP**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.100		mg/L		10/31/14 08:37	10/31/14 17:38	10.0
Arsenic	ND		0.200		mg/L		10/31/14 08:37	10/31/14 17:38	10.0
Barium	291		5.00		mg/L		10/31/14 08:37	10/31/14 17:38	10.0
Cadmium	ND		0.0200		mg/L		10/31/14 08:37	10/31/14 17:38	10.0
Chromium	ND		0.0800		mg/L		10/31/14 08:37	10/31/14 17:38	10.0
Lead	ND		0.300		mg/L		10/31/14 08:37	10/31/14 17:38	10.0
Selenium	ND		0.800		mg/L		10/31/14 08:37	10/31/14 17:38	10.0

**Method: EPA 7471 - TCLP Metals by EPA 1311/6010/7000 Series Methods - TCLP**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000500		mg/L		10/31/14 08:35	10/31/14 15:22	1.00



# QC Sample Results

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

## Method: EPA 6010C - Metals Content by EPA 6010/7000 Series Methods, Prep by EPA 3050B

**Lab Sample ID: 14J0156-BLK1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Method Blank**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		4.00		mg/kg wet		10/24/14 10:21	10/27/14 16:11	1.00
Zinc	3.96	B	2.00		mg/kg wet		10/24/14 10:21	10/27/14 16:11	1.00

**Lab Sample ID: 14J0156-BLK1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Method Blank**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	ND		1.25		mg/kg wet		10/24/14 10:21	10/28/14 13:32	1.00

**Lab Sample ID: 14J0156-BS1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	50.0	45.1		mg/kg wet		90.2	80 - 120
Zinc	50.0	48.3		mg/kg wet		96.6	80 - 120

**Lab Sample ID: 14J0156-BS1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nickel	50.0	45.1		mg/kg wet		90.1	80 - 120

**Lab Sample ID: 14J0156-MS1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	ND		46.3	ND	M4	mg/kg wet			75 - 125
Zinc	82100		46.3	83500	B1	mg/kg wet		3020	75 - 125

**Lab Sample ID: 14J0156-MS1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	%Rec. Limits
Nickel	ND		46.3	ND	M4	mg/kg wet			75 - 125

**Lab Sample ID: 14J0156-MSD1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	ND		48.1	ND	M4	mg/kg wet			75 - 125		20
Zinc	82100		48.1	86400	B1	mg/kg wet		9050	75 - 125	3.47	20

TestAmerica Spokane



# QC Sample Results

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

## Method: EPA 6010C - Metals Content by EPA 6010/7000 Series Methods, Prep by EPA 3050B (Continued)

**Lab Sample ID: 14J0156-MSD1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nickel	ND		48.1	97.8	M4	mg/kg wet		204	75 - 125		20

**Lab Sample ID: 14J0156-DUP1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Duplicate**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Copper	ND		ND		mg/kg wet			20
Zinc	82100		80800	B1	mg/kg wet		1.63	20

**Lab Sample ID: 14J0156-DUP1**  
**Matrix: Other (L)**  
**Analysis Batch: 14J0156**

**Client Sample ID: Duplicate**  
**Prep Type: Total**  
**Prep Batch: 14J0156\_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Nickel	ND		ND		mg/kg wet			20

## Method: EPA 6010C - TCLP Metals by EPA 1311/6010/7000 Series Methods

**Lab Sample ID: 14J0196-BLK1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Method Blank**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.0100		mg/L		10/31/14 08:37	10/31/14 15:26	1.00
Arsenic	ND		0.0200		mg/L		10/31/14 08:37	10/31/14 15:26	1.00
Barium	ND		0.500		mg/L		10/31/14 08:37	10/31/14 15:26	1.00
Cadmium	ND		0.00200		mg/L		10/31/14 08:37	10/31/14 15:26	1.00
Chromium	ND		0.00800		mg/L		10/31/14 08:37	10/31/14 15:26	1.00
Lead	ND		0.0300		mg/L		10/31/14 08:37	10/31/14 15:26	1.00

**Lab Sample ID: 14J0196-BLK1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Method Blank**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		0.0800		mg/L		10/31/14 08:37	10/31/14 17:13	1.00

**Lab Sample ID: 14J0196-BS1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Lab Control Sample**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	1.00	1.03		mg/L		103	80 - 120
Arsenic	1.00	1.04		mg/L		104	80 - 120
Barium	1.00	1.02		mg/L		102	80 - 120
Cadmium	1.00	1.04		mg/L		104	80 - 120
Chromium	1.00	1.01		mg/L		101	80 - 120

TestAmerica Spokane



# QC Sample Results

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

## Method: EPA 6010C - TCLP Metals by EPA 1311/6010/7000 Series Methods (Continued)

**Lab Sample ID: 14J0196-BS1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Lab Control Sample**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lead	1.00	1.04		mg/L		104	80 - 120

**Lab Sample ID: 14J0196-BS1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Lab Control Sample**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Selenium	10.0	10.7		mg/L		107	80 - 120

**Lab Sample ID: 14J0196-MS1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Matrix Spike**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	Limits
Silver	0.000952		1.00	1.07		mg/L		107	75 - 125
Arsenic	0.0168		1.00	1.09		mg/L		107	75 - 125
Barium	0.845		1.00	1.84		mg/L		99.3	75 - 125
Cadmium	ND		1.00	1.07		mg/L		107	75 - 125
Chromium	0.186		1.00	1.15		mg/L		96.5	75 - 125
Lead	0.471		1.00	1.46		mg/L		98.5	75 - 125

**Lab Sample ID: 14J0196-MS1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Matrix Spike**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	Limits
Selenium	0.180		10.0	11.6		mg/L		114	75 - 125

**Lab Sample ID: 14J0196-MSD1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	0.000952		1.00	1.07		mg/L		107	75 - 125	0.116	20
Arsenic	0.0168		1.00	1.14		mg/L		112	75 - 125	4.82	20
Barium	0.845		1.00	1.85		mg/L		100	75 - 125	0.375	20
Cadmium	ND		1.00	1.09		mg/L		109	75 - 125	1.67	20
Chromium	0.186		1.00	1.18		mg/L		98.9	75 - 125	2.11	20
Lead	0.471		1.00	1.47		mg/L		100	75 - 125	1.28	20

**Lab Sample ID: 14J0196-MSD1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Selenium	0.180		10.0	11.6		mg/L		115	75 - 125	0.656	20

TestAmerica Spokane



# QC Sample Results

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

## Method: EPA 6010C - TCLP Metals by EPA 1311/6010/7000 Series Methods (Continued)

**Lab Sample ID: 14J0196-DUP1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Duplicate**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	Limit
Silver	0.000952		ND		mg/L			20
Arsenic	0.0168		ND		mg/L			20
Barium	0.845		0.845		mg/L		0.034	20
Cadmium	ND		ND		mg/L		1	20
Chromium	0.186		0.186		mg/L		0.104	20
Lead	0.471		0.479		mg/L		1.75	20

**Lab Sample ID: 14J0196-DUP1**  
**Matrix: Soil**  
**Analysis Batch: 14J0196**

**Client Sample ID: Duplicate**  
**Prep Type: TCLP**  
**Prep Batch: 14J0196\_P**

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	Limit
Selenium	0.180		0.170		mg/L		5.92	20

## Method: EPA 7471 - TCLP Metals by EPA 1311/6010/7000 Series Methods

**Lab Sample ID: 14J0195-BLK1**  
**Matrix: Other (S)**  
**Analysis Batch: 14J0195**

**Client Sample ID: Method Blank**  
**Prep Type: TCLP**  
**Prep Batch: 14J0195\_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000500		mg/L		10/31/14 08:35	10/31/14 15:19	1.00

**Lab Sample ID: 14J0195-BS1**  
**Matrix: Other (S)**  
**Analysis Batch: 14J0195**

**Client Sample ID: Lab Control Sample**  
**Prep Type: TCLP**  
**Prep Batch: 14J0195\_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.00200	0.00198		mg/L		99.0	80 - 120

**Lab Sample ID: 14J0195-MS1**  
**Matrix: Other (S)**  
**Analysis Batch: 14J0195**

**Client Sample ID: 26626-1 Grease**  
**Prep Type: TCLP**  
**Prep Batch: 14J0195\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	Limits
Mercury	ND		0.00200	0.00144	M2	mg/L		72.0	80 - 120

**Lab Sample ID: 14J0195-MSD1**  
**Matrix: Other (S)**  
**Analysis Batch: 14J0195**

**Client Sample ID: 26626-1 Grease**  
**Prep Type: TCLP**  
**Prep Batch: 14J0195\_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		0.00200	0.00158	M2	mg/L		79.0	80 - 120	9.27	20

TestAmerica Spokane



# QC Sample Results

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

## Method: EPA 7471 - TCLP Metals by EPA 1311/6010/7000 Series Methods (Continued)

Lab Sample ID: 14J0195-DUP1  
Matrix: Other (S)  
Analysis Batch: 14J0195

Client Sample ID: 26626-1 Grease  
Prep Type: TCLP  
Prep Batch: 14J0195\_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	Limit
Mercury	ND		ND		mg/L			20

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# Lab Chronicle

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

**Client Sample ID: 26626-1 Grease**

**Lab Sample ID: SXJ0159-01**

**Date Collected: 10/22/14 00:00**

**Matrix: Other (S)**

**Date Received: 10/23/14 15:10**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	TCLP Extraction		10.0	14J0189	10/30/14 10:03	JSP	TAL SPK
TCLP	Prep	EPA 3005A TCLP		1.00	14J0196_P	10/31/14 08:37	JSP	TAL SPK
TCLP	Analysis	EPA 6010C		10.0	14J0196	10/31/14 17:38	ICP	TAL SPK
Total	Prep	EPA 3050B		0.962	14J0156_P	10/24/14 10:21	JSP	TAL SPK
Total	Analysis	EPA 6010C		1.00	14J0156	10/27/14 16:59	ICP	TAL SPK
Total	Prep	EPA 3050B		0.962	14J0156_P	10/24/14 10:21	JSP	TAL SPK
Total	Analysis	EPA 6010C		1.00	14J0156	10/28/14 13:48	ICP	TAL SPK
TCLP	Leach	TCLP Extraction		1.00	14J0189	10/30/14 10:03	JSP	TAL SPK
TCLP	Prep	EPA 7471		1.00	14J0195_P	10/31/14 08:35	JSP	TAL SPK
TCLP	Analysis	EPA 7471		1.00	14J0195	10/31/14 15:22	ZZZ	TAL SPK

**Laboratory References:**

TAL SPK = TestAmerica Spokane, 11922 East 1st. Avenue, Spokane, WA 99206, TEL (509)924-9200





# Certification Summary

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

TestAmerica Job ID: SXJ0159

## Laboratory: TestAmerica Spokane

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-15

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# Method Summary

Client: Emerald Services Inc.  
Project/Site: Sierra Zinc Mine

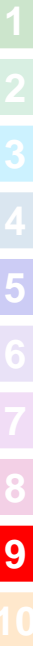
TestAmerica Job ID: SXJ0159

Method	Method Description	Protocol	Laboratory
EPA 6010C	TCLP Metals by EPA 1311/6010/7000 Series Methods		TAL SPK
EPA 6010C	Metals Content by EPA 6010/7000 Series Methods, Prep by EPA 3050B		TAL SPK
EPA 7471	TCLP Metals by EPA 1311/6010/7000 Series Methods		TAL SPK

**Protocol References:**

**Laboratory References:**

TAL SPK = TestAmerica Spokane, 11922 East 1st. Avenue, Spokane, WA 99206, TEL (509)924-9200





# Emerald Recycling Intercompany Chain of Custody

Number **26626 SX1069**

PROJECT/JOB#:

Client: **Sierra Zinc Mine**

Client Address:

Results to/Contact:

Additional Contact Phone/email:

Bill to: Petroleum/Automotive

Industrial

Field Services

Emerald Vancouver

Emerald Tacoma

Emerald - Montana

Emerald- Alaska

Emerald- Utah

Emerald- Spokane/Pasco



www.emeraldrecycling.com

7343 East Marginal Way S

Seattle, WA 98108

Laboratory:

- Emerald -Tacoma
- Emerald -Seattle (APW)
- (other)

Check as many that apply:

Matrix

Aqueous	oil	coolant	solids	fuel	other
---------	-----	---------	--------	------	-------

Profile#

26626-1

Sample ID

Grease

Aq. Liq/ Solids				Oils & Fuels							Misc							
PH	Metals (aqueous/totals)	Metals/TCLP (total metals)	Hydrochlor (coolants only)	Benzene	Percent Glycol	Fats, Oils & Grease (water)	PCBs	Chlor-d-lect	Chlor-d-lect 4000	Flash Point	Metals in Oil	Percent Sulfur	Percent Ash	API/ Pounds per gallon	BTU	Profile Verification	GC/ Macro	Outside Lab (use additional COC)
		X																

notes: **RUN COPPER, NICKEL, ZINC**

19.1

signature	Print Name:	Date/Time:
<i>[Signature]</i>	Lyndsey Fox	10-23-14
<i>[Signature]</i>	Dave Blackham	10-23-14
<i>[Signature]</i>	Cat Stapleton	10-23-14 10:10

- Relinquished by:
- Received by:
- Relinquished by:
- Received by:
- Relinquished by:
- Received by:
- Relinquished by:

White: Laboratory      Yellow: Customer Care      Pink: Accounting





**TestAmerica Spokane  
Sample Receipt Form**

Work Order #: <b>SXJ0159</b>	Client: <b>Emerald Services</b>	Project: <b>Sierra Zine Mine</b>		
Date/Time Received: <b>10-23-14 15:10</b>		By: <b>CS</b>		
Samples Delivered By: <input type="checkbox"/> Shipping Service <input type="checkbox"/> Courier <input checked="" type="checkbox"/> Client <input type="checkbox"/> Other: _____				
List Air Bill Number(s) or Attach a photocopy of the Air Bill:				
Receipt Phase	Yes	No	NA	Comments
Were samples received in a cooler:		X		
Custody Seals are present and intact:			X	
Are CoC documents present:	X			
Necessary signatures:	X			
Thermal Preservation Type: <input type="checkbox"/> Blue Ice <input type="checkbox"/> Gel Ice <input type="checkbox"/> Real Ice <input type="checkbox"/> Dry Ice <input checked="" type="checkbox"/> None <input type="checkbox"/> Other: _____				
Temperature: <b>19.1</b> °C Thermometer (Circle one Serial #122208348 Keyring IR Serial # 111874910 IR Gun 2 )(acceptance criteria 0-6				
Temperature out of range: <input type="checkbox"/> Not enough ice <input type="checkbox"/> Ice melted <input type="checkbox"/> w/in 4hrs of collection <input type="checkbox"/> NA <input type="checkbox"/> Other: _____				
Log-In Phase	Yes	No	NA	Comments
Date/Time: <b>10-23-14 15:15</b> By: <b>CS</b>				
Are sample labels affixed and completed for each container	X			
Samples containers were received intact:	X			
Do sample IDs match the CoC	X			
Appropriate sample containers were received for tests requested	X			
Are sample volumes adequate for tests requested	X			
Appropriate preservatives were used for the tests requested	X			
pH of Inorganic samples checked and is within method specification	X			
Are VOC samples free of bubbles >6mm (1/4" diameter)	X			
Are dissolved parameters field filtered			X	
Do any samples need to be filtered or preserved by the lab			X	
Does this project require quick turnaround analysis			X	
Are there any short hold time tests (see chart below)		X		
Are any samples within 2 days of or past expiration		X		
Was the CoC scanned	X			
Were there Non-conformance issues at login		X		
If yes, was a CAR generated #			X	

24 hours or less	48 hours	7 days
Coliform Bacteria	BOD, Color, MBAS	TDS, TSS, VDS, FDS
Chromium +6	Nitrate/Nitrite	Sulfide
	Orthophosphate	Aqueous Organic Prep

Form No. SP-FORM-SPL-002 12 December 2012

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Pace Analytical Services, Inc.  
11001 Hampshire Avenue S.  
Minneapolis, MN 55438  
(952) 995-2600

Lyndsey Fox  
Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

November 06, 2014

Report #: 1404920

RE: Sierra Zinc

Dear Lyndsey Fox:

Pace Analytical Services, Inc. received samples for the project identified above on November 04, 2014. The sample(s) were analyzed in the Pace-Bloomington laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





11001 Hampshire Ave. S.  
Minneapolis, MN 55438  
(952) 995-2600

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404920  
Project Mgr: Elizabeth Kadlec  
Account ID:

### Qualifiers and Abbreviations

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference





11001 Hampshire Ave. S.  
Minneapolis, MN 55438  
(952) 995-2600

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404920  
Project Mgr: Elizabeth Kadlec  
Account ID:

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
#1 D6 Dozer	1404920-01	Air	10	10/30/14 12:30	11/04/14 13:11
#2 Nixon Fence	1404920-02	Air	10	10/30/14 12:35	11/04/14 13:11
#3 Silt Fence	1404920-03	Air	10	10/30/14 12:45	11/04/14 13:11





11001 Hampshire Ave. S.  
 Minneapolis, MN 55438  
 (952) 995-2600

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1404920 Project Mgr: Elizabeth Kadlec Account ID:
---	--	---

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1404920-01</b>	<b>#1 D6 Dozer</b>								
Lead	< 100	100	ug/m <sup>3</sup>	1	11/4/14	11/5/14	CJS	NIOSH 7303	
<b>1404920-02</b>	<b>#2 Nixon Fence</b>								
Lead	< 100	100	ug/m <sup>3</sup>	1	11/4/14	11/5/14	CJS	NIOSH 7303	
<b>1404920-03</b>	<b>#3 Silt Fence</b>								
Lead	< 100	100	ug/m <sup>3</sup>	1	11/4/14	11/5/14	CJS	NIOSH 7303	





11001 Hampshire Ave. S.  
 Minneapolis, MN 55438  
 (952) 995-2600

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1404920 Project Mgr: Elizabeth Kadlec Account ID:
---	--	---

**RMC**  
 Laboratory Services Request Form

1404920

002/002

<b>CLIENT INFORMATION</b>				<b>SEND REQUESTS TO:</b>	
Client Name: <u>The Goldfield Corporation</u>		Client Address: <u>1684 W. Hibiscus Blvd.</u>		Pace Analytical Services, Inc. 1800 Elm St, Minneapolis MN 55414	
Client Phone: <u>321.724.1700</u>		Client Fax: <u>321.308.1184</u>		Beth Kadlec Phone: (612) 607-6457	
<b>ACCOUNT INFORMATION</b>					
Account Name: <u>Sierra Zinc</u>		Sample Questions: <u>Lyndsey Fox</u> RMC- 801-255-2626			
TAT: <u>RUSH</u>					
P.O. No: <u>Sierra Zinc</u>				Beth.Kadlec@pacelabs.com	
<b>III. REPORT INSTRUCTIONS</b>					
Report Results To: <u>Lyndsey - RMC (lyndsey@rmc-ut.com)</u>					
Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street Suite 102, MIDVALE UT 84047</u>					
Please Forward Results By: <input checked="" type="checkbox"/> US Mail (X) <input type="checkbox"/> Fed Ex ( ) <input type="checkbox"/> Fax ( ) <input checked="" type="checkbox"/> Email (X) <u>lyndsey@rmc-ut.com</u> (date)					
Services Requested below are required no later than _____					
<b>IV. TYPE OF SERVICE REQUESTED</b>					
Please analyze the enclosed environmental samples for:					
Field Sample No./Description	Sampling Date & Time	Volume	No. of Cont.	Analysis Requested	
#1 <u>Nixon Fence</u> <u>WG Dozer</u>	<u>10/30/14 1230</u>	<u>2.5L Ph, 4hrs</u>	<u>1</u>	<u>As lead</u>	
#2 <u>Nixon Fence</u>	<u>11/30/14 1235</u>	<u>S S S</u>	<u>1</u>	<u>S</u>	
#3 <u>S.H Fence</u>	<u>11/30/14 1240</u>	<u>S S S</u>	<u>1</u>	<u>S</u>	
notes: <u>Please CC Jim Fricks with Questions and results (jim@rmc-ut.com)</u>					
<b>V. CHAIN OF CUSTODY RECORD</b>					
Dispatched by:	Date	Time	Counter Co. Name		
Refriniquished by: <u>[Signature]</u>	Date <u>10/31/14</u>	Time <u>1040</u>	Atrbill #		
Received by:	Date	Time	Custody Seal Intact? <u>NA</u>		
Received for lab by: <u>Beth Kadlec</u> <u>Rec/HA</u>	Date <u>11/4/14</u>	Time <u>13:11</u>	Yes No		

10/29/2014 13:27 FAX 801.255.3266



0/13/2014

SZ-A-01 : 2.5 LPH x 3 hours  
SZ-A-02 : 2.5 LPH x 3 hours  
SZ-A-03 : 2.5 LPH x 2 hours

LPH

0/16/2014

SZ-AR-1-10162014 :  
SZ-AR-2-10162014 :  
SZ-AR-3-10162014 :  
SZ-AR-4-10162014 :

LPH

8:16am - 3:30pm  
8:30am - 3:35pm  
9:40am - 3:25pm  
12:30pm - 3:42pm

0/20/2014

SZ-AR-1-10202014 : 10:08am - 3:21pm  
SZ-AR-2-10202014 : 10:10am - 3:25pm  
SZ-AR-3-10202014 : 10:31am - 1:52pm  
SZ-AR-4-10202014 : 10:28am - 3:16pm

LPH

0/21/2014

SZ-AR-1-10212014 : 9-14am - 3:11pm  
SZ-AR-2-10212014 : 9-10am - 3:15pm  
SZ-AR-3-10212014 : 9-22am - 3:03pm

LPH

0/30/2014

#1 : 8:30-12:30pm  
#2 : 8:35am - 12:38pm  
#3 : 8:40am - 12:40pm

LPH



11/12/2014

SZ-RR-1-11172014 : 7:32am - 3:20pm [2.5 LPH]  
SZ-RR-2-11122014 : 7:45am - 3:23pm [3 LPH]  
SZ-RR-3-11122014 : 7:52am - 3:12pm [3 LPH]

7 PM

11/11/2014

SZ-RR-1-11112014 : 7:32am - 3:17pm [3 LPH]  
SZ-RR-2-11112014 : 7:35am - 3:19pm [3 LPH]  
SZ-RR-3-11112014 : 7:40am - 3:20pm [2.5 LPH]

7 PM

11/5/2014

#1 : 10:50am - 2:55pm  
#2 : 10:55am - 3pm  
#3 : 11:00am - 3:05pm

2.5 LPH 7 PM



November 14, 2014

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

RE: Project: Sierra Zinc-REV  
Pace Project No.: 10285669

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

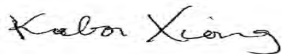
Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

Revised report on 11/4/14 to fix Zn results to report on final report for sample -008.

Revised report on 11/14/14 to correct sample volume on air filter samples per client request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager



## REPORT OF LABORATORY ANALYSIS

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November 14, 2014  
Page 2

Enclosures



## **REPORT OF LABORATORY ANALYSIS**

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## CERTIFICATIONS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

---

### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Sierra Zinc-REV

Pace Project No.: 10285669

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10285669001	SZ-Adit-10142014	Water	10/15/14 07:52	10/17/14 09:30
10285669002	SZ-DC UP-10142014	Water	10/15/14 08:38	10/17/14 09:30
10285669003	SZ-DC Down-10142014	Water	10/15/14 08:44	10/17/14 09:30
10285669004	SZ-DC Down05-10142014	Water	10/15/14 08:49	10/17/14 09:30
10285669005	S2-A-01	Air	10/13/14 12:15	10/17/14 09:30
10285669006	S2-A-02	Air	10/13/14 12:15	10/17/14 09:30
10285669007	S2-A-03	Air	10/13/14 13:15	10/17/14 09:30
10285669008	SZ50-01	Solid	10/13/14 14:00	10/17/14 09:30
10285669009	SZ50-02	Solid	10/13/14 14:30	10/17/14 09:30
10285669010	GFRD-10	Solid	10/13/14 09:00	10/17/14 09:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Sierra Zinc-REV

Pace Project No.: 10285669

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10285669001	SZ-Adit-10142014	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	23	PASI-M
		EPA 245.1	DM	1	PASI-M
		EPA 245.1	DM	1	PASI-M
10285669002	SZ-DC UP-10142014	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	23	PASI-M
		EPA 245.1	DM	1	PASI-M
		EPA 245.1	DM	1	PASI-M
10285669003	SZ-DC Down-10142014	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	23	PASI-M
		EPA 245.1	DM	1	PASI-M
		EPA 245.1	DM	1	PASI-M
10285669004	SZ-DC Down05-10142014	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	23	PASI-M
		EPA 245.1	DM	1	PASI-M
		EPA 245.1	DM	1	PASI-M
10285669008	SZ50-01	EPA 6020	RJS	22	PASI-M
		EPA 7471	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10285669009	SZ50-02	EPA 6020	RJS	22	PASI-M
		EPA 7471	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10285669010	GFRD-10	EPA 6020	RJS	22	PASI-M
		EPA 7471	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

Sample: SZ-Adit-10142014      Lab ID: 10285669001      Collected: 10/15/14 07:52      Received: 10/17/14 09:30      Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8								
Aluminum	ND	ug/L	10.0	1	10/23/14 15:16	10/27/14 15:43	7429-90-5	
Antimony	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7440-36-0	
Arsenic	0.54	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7440-38-2	
Barium	29.0	ug/L	0.30	1	10/23/14 15:16	10/27/14 15:43	7440-39-3	
Beryllium	ND	ug/L	0.20	1	10/23/14 15:16	10/27/14 15:43	7440-41-7	
Cadmium	4.4	ug/L	0.080	1	10/23/14 15:16	10/27/14 15:43	7440-43-9	
Calcium	77000	ug/L	200	5	10/23/14 15:16	10/28/14 08:59	7440-70-2	
Chromium	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7440-47-3	
Cobalt	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7440-48-4	
Copper	1.4	ug/L	1.0	1	10/23/14 15:16	10/27/14 15:43	7440-50-8	
Iron	ND	ug/L	50.0	1	10/23/14 15:16	10/27/14 15:43	7439-89-6	
Lead	6.0	ug/L	0.10	1	10/23/14 15:16	10/27/14 15:43	7439-92-1	
Magnesium	35600	ug/L	50.0	5	10/23/14 15:16	10/28/14 08:59	7439-95-4	
Manganese	0.87	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7439-96-5	
Nickel	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7440-02-0	
Potassium	3500	ug/L	50.0	1	10/23/14 15:16	10/27/14 15:43	7440-09-7	
Selenium	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7782-49-2	
Silver	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 15:43	7440-22-4	
Sodium	10600	ug/L	50.0	1	10/23/14 15:16	10/27/14 15:43	7440-23-5	
Thallium	ND	ug/L	0.10	1	10/23/14 15:16	10/27/14 15:43	7440-28-0	
Vanadium	ND	ug/L	1.0	1	10/23/14 15:16	10/27/14 15:43	7440-62-2	
Zinc	502	ug/L	25.0	5	10/23/14 15:16	10/28/14 08:59	7440-66-6	

<b>200.8 MET ICPMS, Lab Filtered</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8								
Aluminum, Dissolved	21.4	ug/L	10.0	1	10/28/14 12:12	10/29/14 17:33	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7440-36-0	
Arsenic, Dissolved	0.69	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7440-38-2	
Barium, Dissolved	33.6	ug/L	0.30	1	10/28/14 12:12	10/29/14 17:33	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	10/28/14 12:12	10/29/14 17:33	7440-41-7	
Cadmium, Dissolved	4.4	ug/L	0.080	1	10/28/14 12:12	10/29/14 17:33	7440-43-9	
Calcium, Dissolved	79600	ug/L	200	5	10/28/14 12:12	10/29/14 17:37	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7440-48-4	
Copper, Dissolved	1.0	ug/L	1.0	1	10/28/14 12:12	10/29/14 17:33	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	10/28/14 12:12	10/29/14 17:33	7439-89-6	
Lead, Dissolved	5.6	ug/L	0.10	1	10/28/14 12:12	10/29/14 17:33	7439-92-1	
Magnesium, Dissolved	36800	ug/L	50.0	5	10/28/14 12:12	10/29/14 17:37	7439-95-4	
Manganese, Dissolved	2.5	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7440-02-0	
Potassium, Dissolved	3390	ug/L	50.0	1	10/28/14 12:12	10/29/14 17:33	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 17:33	7440-22-4	
Sodium, Dissolved	10400	ug/L	50.0	1	10/28/14 12:12	10/29/14 17:33	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	10/28/14 12:12	10/29/14 17:33	7440-28-0	
Total Hardness by 2340B, Dissolved	350000	ug/L	355	5	10/28/14 12:12	10/29/14 17:37		
Vanadium, Dissolved	ND	ug/L	1.0	1	10/28/14 12:12	10/29/14 17:33	7440-62-2	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

Sample: SZ-Adit-10142014		Lab ID: 10285669001	Collected: 10/15/14 07:52	Received: 10/17/14 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS, Lab Filtered</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Zinc, Dissolved	494 ug/L		25.0	5	10/28/14 12:12	10/29/14 17:37	7440-66-6	
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	ND ug/L		0.20	1	10/22/14 14:50	10/23/14 12:15	7439-97-6	
<b>245.1 Mercury, Lab Filtered</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND ug/L		0.20	1	10/28/14 13:40	10/29/14 12:57	7439-97-6	

Sample: SZ-DC UP-10142014		Lab ID: 10285669002	Collected: 10/15/14 08:38	Received: 10/17/14 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum	11.9 ug/L		10.0	1	10/23/14 15:16	10/27/14 15:46	7429-90-5	
Antimony	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7440-36-0	
Arsenic	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7440-38-2	
Barium	28.7 ug/L		0.30	1	10/23/14 15:16	10/27/14 15:46	7440-39-3	
Beryllium	ND ug/L		0.20	1	10/23/14 15:16	10/27/14 15:46	7440-41-7	
Cadmium	ND ug/L		0.080	1	10/23/14 15:16	10/27/14 15:46	7440-43-9	
Calcium	63100 ug/L		200	5	10/23/14 15:16	10/28/14 09:02	7440-70-2	
Chromium	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7440-47-3	
Cobalt	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7440-48-4	
Copper	ND ug/L		1.0	1	10/23/14 15:16	10/27/14 15:46	7440-50-8	
Iron	ND ug/L		50.0	1	10/23/14 15:16	10/27/14 15:46	7439-89-6	
Lead	ND ug/L		0.10	1	10/23/14 15:16	10/27/14 15:46	7439-92-1	
Magnesium	10900 ug/L		10.0	1	10/23/14 15:16	10/27/14 15:46	7439-95-4	
Manganese	2.1 ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7439-96-5	
Nickel	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7440-02-0	
Potassium	1960 ug/L		50.0	1	10/23/14 15:16	10/27/14 15:46	7440-09-7	
Selenium	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7782-49-2	
Silver	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:46	7440-22-4	
Sodium	3680 ug/L		50.0	1	10/23/14 15:16	10/27/14 15:46	7440-23-5	
Thallium	ND ug/L		0.10	1	10/23/14 15:16	10/27/14 15:46	7440-28-0	
Vanadium	ND ug/L		1.0	1	10/23/14 15:16	10/27/14 15:46	7440-62-2	
Zinc	ND ug/L		5.0	1	10/23/14 15:16	10/27/14 15:46	7440-66-6	

<b>200.8 MET ICPMS, Lab Filtered</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum, Dissolved	ND ug/L		10.0	1	10/28/14 12:12	10/29/14 17:42	7429-90-5	
Antimony, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7440-36-0	
Arsenic, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7440-38-2	
Barium, Dissolved	28.6 ug/L		0.30	1	10/28/14 12:12	10/29/14 17:42	7440-39-3	
Beryllium, Dissolved	ND ug/L		0.20	1	10/28/14 12:12	10/29/14 17:42	7440-41-7	
Cadmium, Dissolved	ND ug/L		0.080	1	10/28/14 12:12	10/29/14 17:42	7440-43-9	
Calcium, Dissolved	56400 ug/L		200	5	10/28/14 12:12	10/29/14 17:47	7440-70-2	
Chromium, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7440-47-3	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

Sample: SZ-DC UP-10142014		Lab ID: 10285669002	Collected: 10/15/14 08:38	Received: 10/17/14 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS, Lab Filtered</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Cobalt, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7440-48-4	
Copper, Dissolved	ND ug/L		1.0	1	10/28/14 12:12	10/29/14 17:42	7440-50-8	
Iron, Dissolved	ND ug/L		50.0	1	10/28/14 12:12	10/29/14 17:42	7439-89-6	
Lead, Dissolved	ND ug/L		0.10	1	10/28/14 12:12	10/29/14 17:42	7439-92-1	
Magnesium, Dissolved	<b>10000</b> ug/L		10.0	1	10/28/14 12:12	10/29/14 17:42	7439-95-4	
Manganese, Dissolved	<b>0.73</b> ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7439-96-5	
Nickel, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7440-02-0	
Potassium, Dissolved	<b>1710</b> ug/L		50.0	1	10/28/14 12:12	10/29/14 17:42	7440-09-7	
Selenium, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7782-49-2	
Silver, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 17:42	7440-22-4	
Sodium, Dissolved	<b>3300</b> ug/L		50.0	1	10/28/14 12:12	10/29/14 17:42	7440-23-5	
Thallium, Dissolved	ND ug/L		0.10	1	10/28/14 12:12	10/29/14 17:42	7440-28-0	
Total Hardness by 2340B, Dissolved	<b>182000</b> ug/L		355	5	10/28/14 12:12	10/29/14 17:47		
Vanadium, Dissolved	ND ug/L		1.0	1	10/28/14 12:12	10/29/14 17:42	7440-62-2	
Zinc, Dissolved	<b>6.1</b> ug/L		5.0	1	10/28/14 12:12	10/29/14 17:42	7440-66-6	
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	ND ug/L		0.20	1	10/22/14 14:50	10/23/14 12:17	7439-97-6	
<b>245.1 Mercury, Lab Filtered</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND ug/L		0.20	1	10/28/14 13:40	10/29/14 12:59	7439-97-6	

Sample: SZ-DC Down-10142014		Lab ID: 10285669003	Collected: 10/15/14 08:44	Received: 10/17/14 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum	<b>84.2</b> ug/L		10.0	1	10/23/14 15:16	10/27/14 15:49	7429-90-5	M1
Antimony	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7440-36-0	
Arsenic	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7440-38-2	
Barium	<b>28.2</b> ug/L		0.30	1	10/23/14 15:16	10/27/14 15:49	7440-39-3	
Beryllium	ND ug/L		0.20	1	10/23/14 15:16	10/27/14 15:49	7440-41-7	
Cadmium	ND ug/L		0.080	1	10/23/14 15:16	10/27/14 15:49	7440-43-9	
Calcium	<b>60100</b> ug/L		200	5	10/23/14 15:16	10/28/14 09:05	7440-70-2	M1
Chromium	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7440-47-3	
Cobalt	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7440-48-4	
Copper	ND ug/L		1.0	1	10/23/14 15:16	10/27/14 15:49	7440-50-8	
Iron	ND ug/L		50.0	1	10/23/14 15:16	10/27/14 15:49	7439-89-6	
Lead	ND ug/L		0.10	1	10/23/14 15:16	10/27/14 15:49	7439-92-1	
Magnesium	<b>10800</b> ug/L		10.0	1	10/23/14 15:16	10/27/14 15:49	7439-95-4	
Manganese	<b>1.4</b> ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7439-96-5	
Nickel	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7440-02-0	
Potassium	<b>1930</b> ug/L		50.0	1	10/23/14 15:16	10/27/14 15:49	7440-09-7	
Selenium	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7782-49-2	

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## ANALYTICAL RESULTS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

Sample: SZ-DC Down-10142014	Lab ID: 10285669003	Collected: 10/15/14 08:44	Received: 10/17/14 09:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Silver	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 15:49	7440-22-4	
Sodium	<b>3550</b> ug/L		50.0	1	10/23/14 15:16	10/27/14 15:49	7440-23-5	M1
Thallium	ND ug/L		0.10	1	10/23/14 15:16	10/27/14 15:49	7440-28-0	
Vanadium	ND ug/L		1.0	1	10/23/14 15:16	10/27/14 15:49	7440-62-2	
Zinc	ND ug/L		5.0	1	10/23/14 15:16	10/27/14 15:49	7440-66-6	
<b>200.8 MET ICPMS, Lab Filtered</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum, Dissolved	ND ug/L		10.0	1	10/28/14 12:12	10/29/14 18:11	7429-90-5	
Antimony, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7440-36-0	
Arsenic, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7440-38-2	
Barium, Dissolved	<b>28.1</b> ug/L		0.30	1	10/28/14 12:12	10/29/14 18:11	7440-39-3	
Beryllium, Dissolved	ND ug/L		0.20	1	10/28/14 12:12	10/29/14 18:11	7440-41-7	
Cadmium, Dissolved	ND ug/L		0.080	1	10/28/14 12:12	10/29/14 18:11	7440-43-9	
Calcium, Dissolved	<b>57400</b> ug/L		200	5	10/28/14 12:12	10/29/14 18:16	7440-70-2	
Chromium, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7440-47-3	
Cobalt, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7440-48-4	
Copper, Dissolved	ND ug/L		1.0	1	10/28/14 12:12	10/29/14 18:11	7440-50-8	
Iron, Dissolved	ND ug/L		50.0	1	10/28/14 12:12	10/29/14 18:11	7439-89-6	
Lead, Dissolved	<b>0.13</b> ug/L		0.10	1	10/28/14 12:12	10/29/14 18:11	7439-92-1	
Magnesium, Dissolved	<b>9840</b> ug/L		10.0	1	10/28/14 12:12	10/29/14 18:11	7439-95-4	
Manganese, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7439-96-5	
Nickel, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7440-02-0	
Potassium, Dissolved	<b>1680</b> ug/L		50.0	1	10/28/14 12:12	10/29/14 18:11	7440-09-7	
Selenium, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7782-49-2	
Silver, Dissolved	ND ug/L		0.50	1	10/28/14 12:12	10/29/14 18:11	7440-22-4	
Sodium, Dissolved	<b>3230</b> ug/L		50.0	1	10/28/14 12:12	10/29/14 18:11	7440-23-5	
Thallium, Dissolved	ND ug/L		0.10	1	10/28/14 12:12	10/29/14 18:11	7440-28-0	
Total Hardness by 2340B, Dissolved	<b>184000</b> ug/L		355	5	10/28/14 12:12	10/29/14 18:16		
Vanadium, Dissolved	ND ug/L		1.0	1	10/28/14 12:12	10/29/14 18:11	7440-62-2	
Zinc, Dissolved	ND ug/L		5.0	1	10/28/14 12:12	10/29/14 18:11	7440-66-6	
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	ND ug/L		0.20	1	10/22/14 14:50	10/23/14 12:20	7439-97-6	
<b>245.1 Mercury, Lab Filtered</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND ug/L		0.20	1	10/28/14 13:40	10/29/14 13:02	7439-97-6	

Sample: SZ-DC Down05-10142014	Lab ID: 10285669004	Collected: 10/15/14 08:49	Received: 10/17/14 09:30	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum	ND ug/L		10.0	1	10/23/14 15:16	10/27/14 16:06	7429-90-5	
Antimony	ND ug/L		0.50	1	10/23/14 15:16	10/27/14 16:06	7440-36-0	

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## ANALYTICAL RESULTS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

**Sample: SZ-DC Down05-10142014**    **Lab ID: 10285669004**    Collected: 10/15/14 08:49    Received: 10/17/14 09:30    Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>								
Analytical Method: EPA 200.8    Preparation Method: EPA 200.8								
Arsenic	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 16:06	7440-38-2	
Barium	<b>28.5</b>	ug/L	0.30	1	10/23/14 15:16	10/27/14 16:06	7440-39-3	
Beryllium	ND	ug/L	0.20	1	10/23/14 15:16	10/27/14 16:06	7440-41-7	
Cadmium	ND	ug/L	0.080	1	10/23/14 15:16	10/27/14 16:06	7440-43-9	
Calcium	<b>61000</b>	ug/L	200	5	10/23/14 15:16	10/28/14 09:08	7440-70-2	
Chromium	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 16:06	7440-47-3	
Cobalt	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 16:06	7440-48-4	
Copper	ND	ug/L	1.0	1	10/23/14 15:16	10/27/14 16:06	7440-50-8	
Iron	ND	ug/L	50.0	1	10/23/14 15:16	10/27/14 16:06	7439-89-6	
Lead	ND	ug/L	0.10	1	10/23/14 15:16	10/27/14 16:06	7439-92-1	
Magnesium	<b>10700</b>	ug/L	10.0	1	10/23/14 15:16	10/27/14 16:06	7439-95-4	
Manganese	<b>1.4</b>	ug/L	0.50	1	10/23/14 15:16	10/27/14 16:06	7439-96-5	
Nickel	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 16:06	7440-02-0	
Potassium	<b>1910</b>	ug/L	50.0	1	10/23/14 15:16	10/27/14 16:06	7440-09-7	
Selenium	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 16:06	7782-49-2	
Silver	ND	ug/L	0.50	1	10/23/14 15:16	10/27/14 16:06	7440-22-4	
Sodium	<b>3500</b>	ug/L	50.0	1	10/23/14 15:16	10/27/14 16:06	7440-23-5	
Thallium	ND	ug/L	0.10	1	10/23/14 15:16	10/27/14 16:06	7440-28-0	
Vanadium	ND	ug/L	1.0	1	10/23/14 15:16	10/27/14 16:06	7440-62-2	
Zinc	ND	ug/L	5.0	1	10/23/14 15:16	10/27/14 16:06	7440-66-6	

### 200.8 MET ICPMS, Lab Filtered

Analytical Method: EPA 200.8    Preparation Method: EPA 200.8

Aluminum, Dissolved	ND	ug/L	10.0	1	10/28/14 12:12	10/29/14 18:21	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7440-38-2	
Barium, Dissolved	<b>28.3</b>	ug/L	0.30	1	10/28/14 12:12	10/29/14 18:21	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	10/28/14 12:12	10/29/14 18:21	7440-41-7	
Cadmium, Dissolved	ND	ug/L	0.080	1	10/28/14 12:12	10/29/14 18:21	7440-43-9	
Calcium, Dissolved	<b>58400</b>	ug/L	200	5	10/28/14 12:12	10/29/14 18:26	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	10/28/14 12:12	10/29/14 18:21	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	10/28/14 12:12	10/29/14 18:21	7439-89-6	
Lead, Dissolved	ND	ug/L	0.10	1	10/28/14 12:12	10/29/14 18:21	7439-92-1	
Magnesium, Dissolved	<b>9990</b>	ug/L	10.0	1	10/28/14 12:12	10/29/14 18:21	7439-95-4	
Manganese, Dissolved	<b>0.52</b>	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7440-02-0	
Potassium, Dissolved	<b>1710</b>	ug/L	50.0	1	10/28/14 12:12	10/29/14 18:21	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	10/28/14 12:12	10/29/14 18:21	7440-22-4	
Sodium, Dissolved	<b>3250</b>	ug/L	50.0	1	10/28/14 12:12	10/29/14 18:21	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	10/28/14 12:12	10/29/14 18:21	7440-28-0	
Total Hardness by 2340B, Dissolved	<b>187000</b>	ug/L	355	5	10/28/14 12:12	10/29/14 18:26		
Vanadium, Dissolved	ND	ug/L	1.0	1	10/28/14 12:12	10/29/14 18:21	7440-62-2	
Zinc, Dissolved	ND	ug/L	5.0	1	10/28/14 12:12	10/29/14 18:21	7440-66-6	

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### ANALYTICAL RESULTS

Project: Sierra Zinc-REV  
Pace Project No.: 10285669

Sample: SZ-DC Down05-10142014		Lab ID: 10285669004	Collected: 10/15/14 08:49	Received: 10/17/14 09:30	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>245.1 Mercury</b> Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	ND ug/L		0.20	1	10/22/14 14:50	10/23/14 12:22	7439-97-6	
<b>245.1 Mercury, Lab Filtered</b> Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND ug/L		0.20	1	10/28/14 13:40	10/29/14 13:14	7439-97-6	

Sample: SZ50-01		Lab ID: 10285669008	Collected: 10/13/14 14:00	Received: 10/17/14 09:30	Matrix: Solid			
<i>Results reported on a "dry-weight" basis</i>								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b> Analytical Method: EPA 6020 Preparation Method: EPA 3050								
Aluminum	<b>17700</b> mg/kg		11.4	20	10/27/14 18:39	10/28/14 09:57	7429-90-5	M6
Antimony	<b>0.63</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7440-36-0	M6
Arsenic	<b>7.8</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7440-38-2	
Barium	<b>145</b> mg/kg		0.34	20	10/27/14 18:39	10/28/14 09:57	7440-39-3	M6
Beryllium	<b>0.61</b> mg/kg		0.23	20	10/27/14 18:39	10/28/14 09:57	7440-41-7	
Cadmium	<b>9.3</b> mg/kg		0.091	20	10/27/14 18:39	10/28/14 09:57	7440-43-9	M6
Calcium	<b>4480</b> mg/kg		45.5	20	10/27/14 18:39	10/28/14 09:57	7440-70-2	M6
Chromium	<b>10.7</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7440-47-3	M6
Cobalt	<b>5.1</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7440-48-4	
Copper	<b>17.3</b> mg/kg		1.1	20	10/27/14 18:39	10/28/14 09:57	7440-50-8	
Iron	<b>15700</b> mg/kg		56.9	20	10/27/14 18:39	10/28/14 09:57	7439-89-6	M6
Lead	<b>382</b> mg/kg		0.11	20	10/27/14 18:39	10/28/14 09:57	7439-92-1	M6
Magnesium	<b>4020</b> mg/kg		11.4	20	10/27/14 18:39	10/28/14 09:57	7439-95-4	M6
Manganese	<b>506</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7439-96-5	M6
Nickel	<b>10.9</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7440-02-0	
Potassium	<b>1280</b> mg/kg		56.9	20	10/27/14 18:39	10/28/14 09:57	7440-09-7	M6
Selenium	<b>0.59</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7782-49-2	
Silver	<b>0.66</b> mg/kg		0.57	20	10/27/14 18:39	10/28/14 09:57	7440-22-4	
Sodium	<b>176</b> mg/kg		56.9	20	10/27/14 18:39	10/28/14 09:57	7440-23-5	M6
Thallium	<b>0.12</b> mg/kg		0.11	20	10/27/14 18:39	10/28/14 09:57	7440-28-0	
Vanadium	<b>21.3</b> mg/kg		1.1	20	10/27/14 18:39	10/28/14 09:57	7440-62-2	M6
Zinc	<b>2670</b> mg/kg		56.9	200	10/27/14 18:39	10/29/14 08:56	7440-66-6	

<b>7471 Mercury</b> Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	ND mg/kg		0.023	1	10/23/14 10:31	10/24/14 12:15	7439-97-6	
<b>Dry Weight</b> Analytical Method: ASTM D2974								
Percent Moisture	<b>13.9</b> %		0.10	1		10/27/14 10:47		

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## ANALYTICAL RESULTS

Project: Sierra Zinc-REV  
Pace Project No.: 10285669

**Sample: SZ50-02**      **Lab ID: 10285669009**      Collected: 10/13/14 14:30      Received: 10/17/14 09:30      Matrix: Solid

**Results reported on a "dry-weight" basis**

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b> Analytical Method: EPA 6020      Preparation Method: EPA 3050								
Aluminum	10700	mg/kg	10.4	20	10/27/14 18:39	10/28/14 09:48	7429-90-5	
Antimony	ND	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7440-36-0	
Arsenic	2.3	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7440-38-2	
Barium	74.8	mg/kg	0.31	20	10/27/14 18:39	10/28/14 09:48	7440-39-3	
Beryllium	0.41	mg/kg	0.21	20	10/27/14 18:39	10/28/14 09:48	7440-41-7	
Cadmium	5.1	mg/kg	0.083	20	10/27/14 18:39	10/28/14 09:48	7440-43-9	
Calcium	1440	mg/kg	41.7	20	10/27/14 18:39	10/28/14 09:48	7440-70-2	
Chromium	11.4	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7440-47-3	
Cobalt	4.2	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7440-48-4	
Copper	9.3	mg/kg	1.0	20	10/27/14 18:39	10/28/14 09:48	7440-50-8	
Iron	13200	mg/kg	52.2	20	10/27/14 18:39	10/28/14 09:48	7439-89-6	
Lead	47.6	mg/kg	0.10	20	10/27/14 18:39	10/28/14 09:48	7439-92-1	
Magnesium	2790	mg/kg	10.4	20	10/27/14 18:39	10/28/14 09:48	7439-95-4	
Manganese	204	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7439-96-5	
Nickel	8.6	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7440-02-0	
Potassium	1340	mg/kg	52.2	20	10/27/14 18:39	10/28/14 09:48	7440-09-7	
Selenium	ND	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7782-49-2	
Silver	ND	mg/kg	0.52	20	10/27/14 18:39	10/28/14 09:48	7440-22-4	
Sodium	97.4	mg/kg	52.2	20	10/27/14 18:39	10/28/14 09:48	7440-23-5	
Thallium	0.12	mg/kg	0.10	20	10/27/14 18:39	10/28/14 09:48	7440-28-0	
Vanadium	22.8	mg/kg	1.0	20	10/27/14 18:39	10/28/14 09:48	7440-62-2	
Zinc	1560	mg/kg	52.2	200	10/27/14 18:39	10/29/14 09:15	7440-66-6	

**7471 Mercury**

Analytical Method: EPA 7471      Preparation Method: EPA 7471

Mercury	ND	mg/kg	0.020	1	10/23/14 10:31	10/24/14 12:21	7439-97-6	
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**Dry Weight**

Analytical Method: ASTM D2974

Percent Moisture	5.1	%	0.10	1		10/27/14 10:48		
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**Sample: GFRD-10**      **Lab ID: 10285669010**      Collected: 10/13/14 09:00      Received: 10/17/14 09:30      Matrix: Solid

**Results reported on a "dry-weight" basis**

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b> Analytical Method: EPA 6020      Preparation Method: EPA 3050								
Aluminum	7840	mg/kg	7.8	20	10/27/14 18:39	10/28/14 09:52	7429-90-5	
Antimony	ND	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7440-36-0	
Arsenic	4.4	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7440-38-2	
Barium	77.8	mg/kg	0.23	20	10/27/14 18:39	10/28/14 09:52	7440-39-3	
Beryllium	0.31	mg/kg	0.16	20	10/27/14 18:39	10/28/14 09:52	7440-41-7	
Cadmium	0.40	mg/kg	0.063	20	10/27/14 18:39	10/28/14 09:52	7440-43-9	
Calcium	28900	mg/kg	313	200	10/27/14 18:39	10/29/14 09:35	7440-70-2	
Chromium	11.9	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7440-47-3	
Cobalt	5.0	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7440-48-4	

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## ANALYTICAL RESULTS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

**Sample: GFRD-10**      **Lab ID: 10285669010**      Collected: 10/13/14 09:00      Received: 10/17/14 09:30      Matrix: Solid

**Results reported on a "dry-weight" basis**

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3050						
Copper	11.9	mg/kg	0.78	20	10/27/14 18:39	10/28/14 09:52	7440-50-8	
Iron	14000	mg/kg	39.1	20	10/27/14 18:39	10/28/14 09:52	7439-89-6	
Lead	15.1	mg/kg	0.078	20	10/27/14 18:39	10/28/14 09:52	7439-92-1	
Magnesium	12800	mg/kg	7.8	20	10/27/14 18:39	10/28/14 09:52	7439-95-4	
Manganese	281	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7439-96-5	
Nickel	12.3	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7440-02-0	
Potassium	1440	mg/kg	39.1	20	10/27/14 18:39	10/28/14 09:52	7440-09-7	
Selenium	0.76	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7782-49-2	
Silver	ND	mg/kg	0.39	20	10/27/14 18:39	10/28/14 09:52	7440-22-4	
Sodium	301	mg/kg	39.1	20	10/27/14 18:39	10/28/14 09:52	7440-23-5	
Thallium	0.11	mg/kg	0.078	20	10/27/14 18:39	10/28/14 09:52	7440-28-0	
Vanadium	26.1	mg/kg	0.78	20	10/27/14 18:39	10/28/14 09:52	7440-62-2	
Zinc	80.6	mg/kg	3.9	20	10/27/14 18:39	10/28/14 09:52	7440-66-6	
<b>7471 Mercury</b>		Analytical Method: EPA 7471    Preparation Method: EPA 7471						
Mercury	ND	mg/kg	0.020	1	10/23/14 10:31	10/24/14 12:27	7439-97-6	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	0.89	%	0.10	1		10/27/14 10:48		

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

QC Batch: MERP/11951      Analysis Method: EPA 245.1  
 QC Batch Method: EPA 245.1      Analysis Description: 245.1 Mercury  
 Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

METHOD BLANK: 1823509      Matrix: Water  
 Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/23/14 11:50	

LABORATORY CONTROL SAMPLE: 1823510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1823511      1823512

Parameter	Units	10285663001		1823511		1823512		% Rec Limits	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				% Rec
Mercury	ug/L	ND	30	30	26.8	26.1	89	87	70-130	2	20

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV  
Pace Project No.: 10285669

QC Batch: MERP/11992      Analysis Method: EPA 245.1  
QC Batch Method: EPA 245.1      Analysis Description: 245.1 Mercury - Dissolved  
Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

METHOD BLANK: 1828370      Matrix: Water  
Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	10/29/14 12:52	

LABORATORY CONTROL SAMPLE: 1828371

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.6	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828888      1828889

Parameter	Units	10285669003		1828888		1828889		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Mercury, Dissolved	ug/L	ND	5	5	4.8	4.6	95	93	70-130	3	20

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

QC Batch: MERP/11961

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10285669008, 10285669009, 10285669010

METHOD BLANK: 1824653

Matrix: Solid

Associated Lab Samples: 10285669008, 10285669009, 10285669010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	10/24/14 12:10	

LABORATORY CONTROL SAMPLE: 1824654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.47	0.45	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1824655 1824656

Parameter	Units	1824655		1824656		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10285669008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	mg/kg	ND	.56	.58	0.55	0.60	94	100	75-125	9	20

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

QC Batch: MPRP/49988      Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8      Analysis Description: 200.8 MET  
 Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

METHOD BLANK: 1823488      Matrix: Water  
 Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	10.0	10/27/14 14:58	
Antimony	ug/L	ND	0.50	10/27/14 14:58	
Arsenic	ug/L	ND	0.50	10/27/14 14:58	
Barium	ug/L	ND	0.30	10/27/14 14:58	
Beryllium	ug/L	ND	0.20	10/27/14 14:58	
Cadmium	ug/L	ND	0.080	10/27/14 14:58	
Calcium	ug/L	ND	40.0	10/27/14 14:58	
Chromium	ug/L	ND	0.50	10/27/14 14:58	
Cobalt	ug/L	ND	0.50	10/27/14 14:58	
Copper	ug/L	ND	1.0	10/27/14 14:58	
Iron	ug/L	ND	50.0	10/27/14 14:58	
Lead	ug/L	ND	0.10	10/27/14 14:58	
Magnesium	ug/L	ND	10.0	10/27/14 14:58	
Manganese	ug/L	ND	0.50	10/27/14 14:58	
Nickel	ug/L	ND	0.50	10/27/14 14:58	
Potassium	ug/L	ND	50.0	10/27/14 14:58	
Selenium	ug/L	ND	0.50	10/27/14 14:58	
Silver	ug/L	ND	0.50	10/27/14 14:58	
Sodium	ug/L	ND	50.0	10/27/14 14:58	
Thallium	ug/L	ND	0.10	10/27/14 14:58	
Vanadium	ug/L	ND	1.0	10/27/14 14:58	
Zinc	ug/L	ND	5.0	10/27/14 14:58	

LABORATORY CONTROL SAMPLE: 1823489

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	80	80.3	100	85-115	
Antimony	ug/L	80	79.2	99	85-115	
Arsenic	ug/L	80	78.0	97	85-115	
Barium	ug/L	80	79.7	100	85-115	
Beryllium	ug/L	80	75.1	94	85-115	
Cadmium	ug/L	80	79.8	100	85-115	
Calcium	ug/L	1000	1020	102	85-115	
Chromium	ug/L	80	77.0	96	85-115	
Cobalt	ug/L	80	80.8	101	85-115	
Copper	ug/L	80	77.1	96	85-115	
Iron	ug/L	1000	1010	101	85-115	
Lead	ug/L	80	78.4	98	85-115	
Magnesium	ug/L	1000	962	96	85-115	
Manganese	ug/L	80	76.1	95	85-115	

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

LABORATORY CONTROL SAMPLE: 1823489

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	ug/L	80	76.8	96	85-115	
Potassium	ug/L	1000	971	97	85-115	
Selenium	ug/L	80	80.5	101	85-115	
Silver	ug/L	80	78.7	98	85-115	
Sodium	ug/L	1000	1020	102	85-115	
Thallium	ug/L	80	81.2	102	85-115	
Vanadium	ug/L	80	76.0	95	85-115	
Zinc	ug/L	80	77.5	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1823490 1823491

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10285454004 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum	ug/L	30.1	80	80	125	138	119	135	70-130	10	20 M1
Antimony	ug/L	ND	80	80	81.1	88.7	101	111	70-130	9	20
Arsenic	ug/L	1.3	80	80	83.1	89.3	102	110	70-130	7	20
Barium	ug/L	198	80	80	286	321	110	154	70-130	11	20 M1
Beryllium	ug/L	ND	80	80	76.8	76.5	96	96	70-130	0	20
Cadmium	ug/L	ND	80	80	81.9	88.6	102	111	70-130	8	20
Calcium	ug/L	90500	1000	1000	93700	103000	326	1260	70-130	10	20 M1
Chromium	ug/L	0.67	80	80	80.8	87.3	100	108	70-130	8	20
Cobalt	ug/L	ND	80	80	76.7	82.8	96	103	70-130	8	20
Copper	ug/L	1.6	80	80	80.3	86.5	98	106	70-130	7	20
Iron	ug/L	98.4	1000	1000	1180	1280	108	118	70-130	8	20
Lead	ug/L	ND	80	80	76.4	83.0	95	104	70-130	8	20
Magnesium	ug/L	34400	1000	1000	37200	40900	282	654	70-130	10	20 M1
Manganese	ug/L	29.2	80	80	109	118	100	111	70-130	8	20
Nickel	ug/L	1.2	80	80	79.2	85.4	98	105	70-130	8	20
Potassium	ug/L	3980	1000	1000	4880	5360	89	138	70-130	9	20 M1
Selenium	ug/L	ND	80	80	83.6	84.0	104	105	70-130	1	20
Silver	ug/L	ND	80	80	76.4	83.0	95	104	70-130	8	20
Sodium	ug/L	9960	1000	1000	11400	12400	145	248	70-130	9	20 M1
Thallium	ug/L	ND	80	80	77.7	84.2	97	105	70-130	8	20
Vanadium	ug/L	ND	80	80	82.2	88.2	102	110	70-130	7	20
Zinc	ug/L	ND	80	80	81.3	86.0	98	104	70-130	6	20

MATRIX SPIKE SAMPLE: 1823492

Parameter	Units	10285669003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L		84.2	80	90.1	7	70-130 M1
Antimony	ug/L		ND	80	76.2	95	70-130
Arsenic	ug/L		ND	80	78.5	98	70-130
Barium	ug/L		28.2	80	99.0	88	70-130
Beryllium	ug/L		ND	80	72.0	90	70-130

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

MATRIX SPIKE SAMPLE: 1823492		10285669003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Cadmium	ug/L	ND	80	76.3	95	70-130	
Calcium	ug/L	60100	1000	56400	-360	70-130	M1
Chromium	ug/L	ND	80	75.5	94	70-130	
Cobalt	ug/L	ND	80	72.9	91	70-130	
Copper	ug/L	ND	80	75.9	94	70-130	
Iron	ug/L	ND	1000	1040	102	70-130	
Lead	ug/L	ND	80	71.5	89	70-130	
Magnesium	ug/L	10800	1000	11600	77	70-130	
Manganese	ug/L	1.4	80	75.0	92	70-130	
Nickel	ug/L	ND	80	73.6	92	70-130	
Potassium	ug/L	1930	1000	2680	75	70-130	
Selenium	ug/L	ND	80	78.5	98	70-130	
Silver	ug/L	ND	80	73.9	92	70-130	
Sodium	ug/L	3550	1000	4950	140	70-130	M1
Thallium	ug/L	ND	80	73.1	91	70-130	
Vanadium	ug/L	ND	80	76.1	95	70-130	
Zinc	ug/L	ND	80	75.3	93	70-130	

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

QC Batch: MPRP/50146

Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8

Analysis Description: 200.8 MET Dissolved

Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

METHOD BLANK: 1828299

Matrix: Water

Associated Lab Samples: 10285669001, 10285669002, 10285669003, 10285669004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	10.0	10/29/14 17:03	
Antimony, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Arsenic, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Barium, Dissolved	ug/L	ND	0.30	10/29/14 17:03	
Beryllium, Dissolved	ug/L	ND	0.20	10/29/14 17:03	
Cadmium, Dissolved	ug/L	ND	0.080	10/29/14 17:03	
Calcium, Dissolved	ug/L	ND	40.0	10/29/14 17:03	
Chromium, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Cobalt, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Copper, Dissolved	ug/L	ND	1.0	10/29/14 17:03	
Iron, Dissolved	ug/L	ND	50.0	10/29/14 17:03	
Lead, Dissolved	ug/L	ND	0.10	10/29/14 17:03	
Magnesium, Dissolved	ug/L	ND	10.0	10/29/14 17:03	
Manganese, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Nickel, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Potassium, Dissolved	ug/L	ND	50.0	10/29/14 17:03	
Selenium, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Silver, Dissolved	ug/L	ND	0.50	10/29/14 17:03	
Sodium, Dissolved	ug/L	ND	50.0	10/29/14 17:03	
Thallium, Dissolved	ug/L	ND	0.10	10/29/14 17:03	
Vanadium, Dissolved	ug/L	ND	1.0	10/29/14 17:03	
Zinc, Dissolved	ug/L	ND	5.0	10/29/14 17:03	

LABORATORY CONTROL SAMPLE: 1828300

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	80	77.2	97	85-115	
Antimony, Dissolved	ug/L	80	73.7	92	85-115	
Arsenic, Dissolved	ug/L	80	76.4	96	85-115	
Barium, Dissolved	ug/L	80	75.8	95	85-115	
Beryllium, Dissolved	ug/L	80	79.4	99	85-115	
Cadmium, Dissolved	ug/L	80	76.3	95	85-115	
Calcium, Dissolved	ug/L	1000	966	97	85-115	
Chromium, Dissolved	ug/L	80	78.0	98	85-115	
Cobalt, Dissolved	ug/L	80	77.8	97	85-115	
Copper, Dissolved	ug/L	80	77.9	97	85-115	
Iron, Dissolved	ug/L	1000	950	95	85-115	
Lead, Dissolved	ug/L	80	80.6	101	85-115	
Magnesium, Dissolved	ug/L	1000	972	97	85-115	
Manganese, Dissolved	ug/L	80	77.3	97	85-115	

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV  
Pace Project No.: 10285669

LABORATORY CONTROL SAMPLE: 1828300

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	80	77.6	97	85-115	
Potassium, Dissolved	ug/L	1000	998	100	85-115	
Selenium, Dissolved	ug/L	80	73.1	91	85-115	
Silver, Dissolved	ug/L	80	77.4	97	85-115	
Sodium, Dissolved	ug/L	1000	982	98	85-115	
Thallium, Dissolved	ug/L	80	80.8	101	85-115	
Vanadium, Dissolved	ug/L	80	77.9	97	85-115	
Zinc, Dissolved	ug/L	80	75.5	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828301 1828302

Parameter	Units	10285130004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Aluminum, Dissolved	ug/L		80	80	90.4	87.0	103	98	70-130	4	20		
Antimony, Dissolved	ug/L		80	80	74.9	75.0	94	94	70-130	0	20		
Arsenic, Dissolved	ug/L		80	80	88.7	88.8	95	95	70-130	0	20		
Barium, Dissolved	ug/L		80	80	83.9	84.0	96	96	70-130	0	20		
Beryllium, Dissolved	ug/L		80	80	80.8	81.2	101	102	70-130	1	20		
Cadmium, Dissolved	ug/L		80	80	75.8	77.2	95	96	70-130	2	20		
Calcium, Dissolved	ug/L		1000	1000	8420	8380	97	93	70-130	1	20		
Chromium, Dissolved	ug/L		80	80	78.3	76.7	97	95	70-130	2	20		
Cobalt, Dissolved	ug/L		80	80	77.7	77.3	97	97	70-130	0	20		
Copper, Dissolved	ug/L		80	80	77.4	77.4	95	95	70-130	0	20		
Iron, Dissolved	ug/L		1000	1000	965	969	94	95	70-130	0	20		
Lead, Dissolved	ug/L	0.12	80	80	81.8	80.8	102	101	70-130	1	20		
Magnesium, Dissolved	ug/L		1000	1000	9240	9210	94	91	70-130	0	20		
Manganese, Dissolved	ug/L		80	80	78.8	77.8	97	95	70-130	1	20		
Nickel, Dissolved	ug/L		80	80	80.2	80.4	97	97	70-130	0	20		
Potassium, Dissolved	ug/L		1000	1000	2640	2620	99	97	70-130	1	20		
Selenium, Dissolved	ug/L		80	80	75.6	76.4	94	95	70-130	1	20		
Silver, Dissolved	ug/L		80	80	76.9	77.3	96	97	70-130	0	20		
Sodium, Dissolved	ug/L		1000	1000	11400	11200	104	84	70-130	2	20		
Thallium, Dissolved	ug/L		80	80	82.0	80.9	102	101	70-130	1	20		
Vanadium, Dissolved	ug/L		80	80	83.7	82.2	98	96	70-130	2	20		
Zinc, Dissolved	ug/L	ND	80	80	77.9	77.7	94	93	70-130	0	20		

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV  
Pace Project No.: 10285669

QC Batch: MPRP/50061 Analysis Method: EPA 6020  
QC Batch Method: EPA 3050 Analysis Description: 6020 MET  
Associated Lab Samples: 10285669008, 10285669009, 10285669010

METHOD BLANK: 1825672 Matrix: Solid  
Associated Lab Samples: 10285669008, 10285669009, 10285669010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.4	10/28/14 09:33	
Antimony	mg/kg	ND	0.47	10/28/14 09:33	
Arsenic	mg/kg	ND	0.47	10/28/14 09:33	
Barium	mg/kg	ND	0.28	10/28/14 09:33	
Beryllium	mg/kg	ND	0.19	10/28/14 09:33	
Cadmium	mg/kg	ND	0.075	10/28/14 09:33	
Calcium	mg/kg	ND	37.7	10/28/14 09:33	
Chromium	mg/kg	ND	0.47	10/28/14 09:33	
Cobalt	mg/kg	ND	0.47	10/28/14 09:33	
Copper	mg/kg	ND	0.94	10/28/14 09:33	
Iron	mg/kg	ND	47.2	10/28/14 09:33	
Lead	mg/kg	ND	0.094	10/28/14 09:33	
Magnesium	mg/kg	ND	9.4	10/28/14 09:33	
Manganese	mg/kg	ND	0.47	10/28/14 09:33	
Nickel	mg/kg	ND	0.47	10/28/14 09:33	
Potassium	mg/kg	ND	47.2	10/28/14 09:33	
Selenium	mg/kg	ND	0.47	10/28/14 09:33	
Silver	mg/kg	ND	0.47	10/28/14 09:33	
Sodium	mg/kg	ND	47.2	10/28/14 09:33	
Thallium	mg/kg	ND	0.094	10/28/14 09:33	
Vanadium	mg/kg	ND	0.94	10/28/14 09:33	
Zinc	mg/kg	ND	4.7	10/28/14 09:33	

LABORATORY CONTROL SAMPLE: 1825673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	18.5	21.4	115	80-120	
Antimony	mg/kg	18.5	17.3	94	80-120	
Arsenic	mg/kg	18.5	17.5	95	80-120	
Barium	mg/kg	18.5	17.7	96	80-120	
Beryllium	mg/kg	18.5	18.8	101	80-120	
Cadmium	mg/kg	18.5	18.3	99	80-120	
Calcium	mg/kg	231	227	98	80-120	
Chromium	mg/kg	18.5	18.8	102	80-120	
Cobalt	mg/kg	18.5	18.6	100	80-120	
Copper	mg/kg	18.5	18.3	99	80-120	
Iron	mg/kg	231	229	99	80-120	
Lead	mg/kg	18.5	18.2	99	80-120	
Magnesium	mg/kg	231	235	102	80-120	
Manganese	mg/kg	18.5	18.9	102	80-120	

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

LABORATORY CONTROL SAMPLE: 1825673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	mg/kg	18.5	18.8	102	80-120	
Potassium	mg/kg	231	261	113	80-120	
Selenium	mg/kg	18.5	18.3	99	80-120	
Silver	mg/kg	18.5	18.0	97	80-120	
Sodium	mg/kg	231	228	98	80-120	
Thallium	mg/kg	18.5	18.5	100	80-120	
Vanadium	mg/kg	18.5	17.8	96	80-120	
Zinc	mg/kg	18.5	18.1	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1825674 1825675

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10285669008 Result	Spike Conc.	Spike Conc.	MSD Conc.								
Aluminum	mg/kg	17700	22.1	22.5	20700	21100	13200	14900	75-125	2	20	M6	
Antimony	mg/kg	0.63	22.1	22.5	15.2	15.5	66	66	75-125	2	20	M6	
Arsenic	mg/kg	7.8	22.1	22.5	32.5	34.6	112	119	75-125	6	20		
Barium	mg/kg	145	22.1	22.5	184	184	176	175	75-125	0	20	M6	
Beryllium	mg/kg	0.61	22.1	22.5	24.1	25.3	106	109	75-125	5	20		
Cadmium	mg/kg	9.3	22.1	22.5	38.1	36.1	130	119	75-125	5	20	M6	
Calcium	mg/kg	4480	276	282	6240	6430	636	691	75-125	3	20	M6	
Chromium	mg/kg	10.7	22.1	22.5	38.2	39.9	124	129	75-125	4	20	M6	
Cobalt	mg/kg	5.1	22.1	22.5	31.5	31.5	119	117	75-125	0	20		
Copper	mg/kg	17.3	22.1	22.5	44.9	45.2	125	124	75-125	1	20		
Iron	mg/kg	15700	276	282	17700	17200	759	540	75-125	3	20	M6	
Lead	mg/kg	382	22.1	22.5	389	321	34	-267	75-125	19	20	M6	
Magnesium	mg/kg	4020	276	282	5480	5440	528	504	75-125	1	20	M6	
Manganese	mg/kg	506	22.1	22.5	756	647	1130	625	75-125	16	20	M6	
Nickel	mg/kg	10.9	22.1	22.5	36.7	38.5	117	122	75-125	5	20		
Potassium	mg/kg	1280	276	282	1660	1800	139	186	75-125	8	20	M6	
Selenium	mg/kg	0.59	22.1	22.5	24.3	26.1	107	113	75-125	7	20		
Silver	mg/kg	0.66	22.1	22.5	25.0	25.3	110	109	75-125	1	20		
Sodium	mg/kg	176	276	282	538	545	131	131	75-125	1	20	M6	
Thallium	mg/kg	0.12	22.1	22.5	24.8	25.3	112	112	75-125	2	20		
Vanadium	mg/kg	21.3	22.1	22.5	53.2	50.1	144	128	75-125	6	20	M6	
Zinc	mg/kg	2670	22.1	22.5	2670	2540	-5	-575	75-125	5	20	E,M6	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc-REV

Pace Project No.: 10285669

QC Batch: MPRP/50116

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10285669008, 10285669009, 10285669010

SAMPLE DUPLICATE: 1827558

Parameter	Units	10285669008 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.9	13.9	0	30	

SAMPLE DUPLICATE: 1827559

Parameter	Units	10285752002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.4	13.3	1	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Sierra Zinc-REV

Pace Project No.: 10285669

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Sierra Zinc-REV  
Pace Project No.: 10285669

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10285669001	SZ-Adit-10142014	EPA 200.8	MPRP/49988	EPA 200.8	ICPM/22258
10285669002	SZ-DC UP-10142014	EPA 200.8	MPRP/49988	EPA 200.8	ICPM/22258
10285669003	SZ-DC Down-10142014	EPA 200.8	MPRP/49988	EPA 200.8	ICPM/22258
10285669004	SZ-DC Down05-10142014	EPA 200.8	MPRP/49988	EPA 200.8	ICPM/22258
10285669001	SZ-Adit-10142014	EPA 200.8	MPRP/50146	EPA 200.8	ICPM/22295
10285669002	SZ-DC UP-10142014	EPA 200.8	MPRP/50146	EPA 200.8	ICPM/22295
10285669003	SZ-DC Down-10142014	EPA 200.8	MPRP/50146	EPA 200.8	ICPM/22295
10285669004	SZ-DC Down05-10142014	EPA 200.8	MPRP/50146	EPA 200.8	ICPM/22295
10285669008	SZ50-01	EPA 3050	MPRP/50061	EPA 6020	ICPM/22274
10285669009	SZ50-02	EPA 3050	MPRP/50061	EPA 6020	ICPM/22274
10285669010	GFRD-10	EPA 3050	MPRP/50061	EPA 6020	ICPM/22274
10285669001	SZ-Adit-10142014	EPA 245.1	MERP/11951	EPA 245.1	MERC/13806
10285669002	SZ-DC UP-10142014	EPA 245.1	MERP/11951	EPA 245.1	MERC/13806
10285669003	SZ-DC Down-10142014	EPA 245.1	MERP/11951	EPA 245.1	MERC/13806
10285669004	SZ-DC Down05-10142014	EPA 245.1	MERP/11951	EPA 245.1	MERC/13806
10285669001	SZ-Adit-10142014	EPA 245.1	MERP/11992	EPA 245.1	MERC/13851
10285669002	SZ-DC UP-10142014	EPA 245.1	MERP/11992	EPA 245.1	MERC/13851
10285669003	SZ-DC Down-10142014	EPA 245.1	MERP/11992	EPA 245.1	MERC/13851
10285669004	SZ-DC Down05-10142014	EPA 245.1	MERP/11992	EPA 245.1	MERC/13851
10285669008	SZ50-01	EPA 7471	MERP/11961	EPA 7471	MERC/13812
10285669009	SZ50-02	EPA 7471	MERP/11961	EPA 7471	MERC/13812
10285669010	GFRD-10	EPA 7471	MERP/11961	EPA 7471	MERC/13812
10285669008	SZ50-01	ASTM D2974	MPRP/50116		
10285669009	SZ50-02	ASTM D2974	MPRP/50116		
10285669010	GFRD-10	ASTM D2974	MPRP/50116		

### REPORT OF LABORATORY ANALYSIS

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**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1  
1850664

**Section A**  
Required Client Information:  
Company: The Goldfield Corporation  
Address: 1684 W. Hibiscus Blvd  
Melbourne, FL 32901-2631  
Phone: 321.724.1700  
Fax: 321.308.1164  
Requested Due Date/TAT: Standard

**Section B**  
Required Project Information:  
Report To: Lyndsey Fox (Lyndsey@rnc-ut.com)  
Copy To: Lyndsey Fox (Lyndsey@rnc-ut.com)  
Purchase Order No.: Sierra Zinc  
Project Name: Sierra Zinc  
Project Number: Standard

**Section C**  
Invoice Information:  
Attention: Deusse Diaz  
Company Name: The Goldfield Corporation  
Address: 1684 W. Hibiscus Blvd Melbourne, FL 32901  
Reference: Lori Casstille  
Pace Profile #:

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER CEMUA  
Site Location: WA  
STATE: WA

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB						
1	SZ-ADIT-10142014	DW	WT G	10/17/14	10/17/14	NA 2	2	Unpreserved	Analysis Test ↑	N	001
2	SZ-DCUP-10142014	WW	WT G	10/17/14	10/17/14	0838	2	Unpreserved	Analysis Test ↑	Y	002
3	SZ-DC Down-10142014	P	WT G	10/17/14	10/17/14	0844	2	Unpreserved	Analysis Test ↑	Y	003
4	SZ-DC Down 05-10142014	SL	WT G	10/13/14	10/13/14	0849	2	Unpreserved	Analysis Test ↑	Y	004
5	<del>SIERRA</del> SZ-A-D1	WP	AR G	10/13/14	10/13/14		1	Unpreserved	Analysis Test ↑	Y	2 day TAT on col
6	SIERRA SZ-A-D2	WP	AR G	10/15/14	10/15/14		1	Unpreserved	Analysis Test ↑	Y	Air samples col
7	<del>SIERRA</del> SZ-S-2-A-D3	AR	AR G	10/15/14	10/15/14		1	Unpreserved	Analysis Test ↑	Y	008
8	SZ-SO-01	TS	SL C	10/15/14	10/15/14		1	Unpreserved	Analysis Test ↑	Y	009
9	SZ-SO-02	TS	SL C	10/15/14	10/15/14		1	Unpreserved	Analysis Test ↑	Y	010
10	SIERRA-D-10	OT	SL C	10/15/14	10/15/14		1	Unpreserved	Analysis Test ↑	Y	
11											
12											

**ADDITIONAL COMMENTS**  
RESULTS to: Lyndsey@rnc-ut.com (rnc)

**RELIQUISHED BY / AFFILIATION**  
Lyndsey Fox

**DATE**  
10/15/2014 5:46

**ACCEPTED BY / AFFILIATION**  
Lyndsey Fox

**DATE**  
10/15/2014 9:30

**TEMP IN °C**  
2.7

**Received on**  
Ice (Y/N)

**Custody**  
Sealed Cooler (Y/N)

**Samples Intact**  
(Y/N)

**SAMPLER NAME AND SIGNATURE**  
ORIGINAL  
PRINT Name of SAMPLER: Lyndsey Fox  
SIGNATURE of SAMPLER: Lyndsey Fox  
DATE Signed (MM/DD/YY):



**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals - Solids (Soil, Rock, Sediments and Tailings)</b>								
		mg/kg	mg/kg					
Al	EPA 6020	2.00	4.00	Glass or Polyethylene	Jar 1	6°C	None	180
Sb	EPA 6020	0.104	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
As	EPA 6020	0.188	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ba	EPA 6020	0.088	0.30	Glass or Polyethylene	Jar 1	6°C	None	180
Be	EPA 6020	0.058	0.20	Glass or Polyethylene	Jar 1	6°C	None	180
Cd	EPA 6020	0.024	0.08	Glass or Polyethylene	Jar 1	6°C	None	180
Ca	EPA 6020	10.00	20.00	Glass or Polyethylene	Jar 1	6°C	None	180
Cr	EPA 6020	0.173	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Co	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Cu	EPA 6020	0.250	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Fe	EPA 6020	10.67	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Pb	EPA 6020	0.030	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
Mg	EPA 6020	2.50	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Mn	EPA 6020	0.108	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ni	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
K	EPA 6020	9.86	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Se	EPA 6020	0.198	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ag	EPA 6020	0.207	0.5	Glass or Polyethylene	Jar 1	6°C	None	180
Na	EPA 6020	20.74	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Th	EPA 6020	0.036	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
V	EPA 6020	0.050	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Zn	EPA 6020	1.15	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Hg	EPA 7471	0.006	0.02	Glass or Polyethylene	Jar 1	6°C	None	180

N/A - Not Applicable TBD - To be determined

Action limits TBD

<sup>1</sup> - Parameters to be collected at each location may vary, detection limits and methods may vary by location and anticipated concentrations.

<sup>2</sup> - All units in ug/L except as noted.

<sup>3</sup> - See bottle list for sample volumes at each sample station. Actual bottle list will be dependent on parameter list for each event and lab requirements.

<sup>4</sup> - Laboratory will measure the temperature of each cooler upon receipt to ensure proper temperature was maintained (4°C +/- 2°C)

<sup>5</sup> - Filtering and preservation may conducted by Laboratory, field filtered samples will be preserved with HNO3 (pH<2)

Bottle 1 - TBD volume bottle unfiltered and preserved with HNO3 for Total Metals.

Bottle 2 - TBD volume bottle . Preserved with HNO3 after field filtering for Dissolved Metals or unfiltered and unpreserved for laboratory filtered Dissolved Metals .

Jar 1 - To be supplied by laboratory.



**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
pH, Temperature, Conductivity, Redox, Dissolved Oxygen, Flow	Field	NA	NA	Instream and/or Polyethylene	500 ml	NA	None	NA
<b>Metals Water - Total</b>								
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cd	EPA 200.8	0.032	0.08	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180



**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals Water- Dissolved</b>				Polyethylene	Bottle 2	6°C	See Note 5	180
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 2	6°C	See Note 5	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 2	6°C	See Note 5	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	See Note 5	180
Cd	EPA 200.8	0.032	0.08	Polyethylene	Bottle 1	6°C	See Note 5	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 2	6°C	See Note 5	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 2	6°C	See Note 5	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 2	6°C	See Note 5	180



Sample Condition  
Upon Receipt

Client Name: W Goldfield Co

Project #: **WO# : 10285669**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
 Tracking Number: 8053 843 5113

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No

Thermom. Used:  B88A9130516413  B88A912167504  B88A9132521491      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 2.5      Cooler Temp Corrected (°C): 2.7      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: 10.2      Date and Initials of Person Examining Contents: 10/17/14 BO

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested? <u>BO 10/17/14</u>	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	11.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT, SL, AR</u>			
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH >12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):			

13.  HNO<sub>3</sub>  H<sub>2</sub>SO<sub>4</sub>  NaOH  HCl  
 Sample # 01-04  
 Initial when completed: \_\_\_\_\_ Lot # of added preservative: \_\_\_\_\_

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Project Manager Review: Kalin Xiong

Date: Oct. 20, 2014

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





88 Empire Drive  
St Paul, MN 55103  
Tel: 651-642-1150  
Fax: 651-642-1239

November 14, 2014

## REVISION

Kabor Xiong  
Pace Analytical Services, Inc.  
1700 Elm Street Southeast  
Minneapolis, MN 55414

Work Order Number: 1404947  
RE: Analytical Services

This is a revised report. The details of the revision are listed in the case narrative on the following page.

Enclosed are the results of analyses for samples received by the laboratory on 10/28/14. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. Dust wipe and air samples are consumed during analysis. All samples were received in acceptable condition unless otherwise noted in the case narrative.

AIHA-LAP, LLC, Accreditation # 101095

Prepared by,  
LEGEND TECHNICAL SERVICES, INC

---

Bach Pham  
Client Manager II  
bpham@legend-group.com





88 Empire Drive  
 St Paul, MN 55103  
 Tel: 651-642-1150  
 Fax: 651-642-1239

Pace Analytical Services, Inc. 1700 Elm Street Southeast Minneapolis, MN 55414	Project: Analytical Services Project Number: 10285669 Project Manager: Kabor Xiong	Work Order #: 1404947 Date Reported: 11/14/14
--	--	--

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date/Time Sampled	Date/Time Received
S2-A-01	1404947-01	Air	10/13/14 12:15	10/28/14 14:30
S2-A-02	1404947-02	Air	10/13/14 12:15	10/28/14 14:30
S2-A-03	1404947-03	Air	10/13/14 13:15	10/28/14 14:30

**Case Narrative:**

The data table units for the blank and QC samples are not ug/m<sup>3</sup>; the actual units are ug/filter.

Per the client's request, this report was revised on November 14, 2014 to change the volumes for samples S2-A-01, S2-A-02, and S2-A-03 to 450 L, 450 L, and 300 L respectively. This report was also revised to report results as ug/m<sup>3</sup>. This report supersedes the report dated November 3, 2014.





88 Empire Drive  
 St Paul, MN 55103  
 Tel: 651-642-1150  
 Fax: 651-642-1239

Pace Analytical Services, Inc. 1700 Elm Street Southeast Minneapolis, MN 55414	Project: Analytical Services Project Number: 10285669 Project Manager: Kabor Xiong	Work Order #: 1404947 Date Reported: 11/14/14
--	--	--

**TOTAL METALS ANALYSIS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	Unit	Batch	Prepared	Analyzed	Method	Notes
<b>S2-A-01 (1404947-01) Air</b>								
Lead	<2.2	2.2	ug/m <sup>3</sup>	B4J3014	10/30/14	10/31/14	NIOSH 7303(M)	
<b>S2-A-02 (1404947-02) Air</b>								
Lead	<2.2	2.2	ug/m <sup>3</sup>	B4J3014	10/30/14	10/31/14	NIOSH 7303(M)	
<b>S2-A-03 (1404947-03) Air</b>								
Lead	<3.3	3.3	ug/m <sup>3</sup>	B4J3014	10/30/14	10/31/14	NIOSH 7303(M)	





88 Empire Drive  
 St Paul, MN 55103  
 Tel: 651-642-1150  
 Fax: 651-642-1239

Pace Analytical Services, Inc. 1700 Elm Street Southeast Minneapolis, MN 55414	Project: Analytical Services Project Number: 10285669 Project Manager: Kabor Xiong	Work Order #: 1404947 Date Reported: 11/14/14
--	--	--

**TOTAL METALS ANALYSIS - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	Unit	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B4J3014 - EPA 3050B</b>										
<b>Blank (B4J3014-BLK1)</b> Prepared: 10/30/14 Analyzed: 10/31/14										
Lead	<1.0	1.0	ug/m <sup>3</sup>							
<b>Blank (B4J3014-BLK2)</b> Prepared: 10/30/14 Analyzed: 10/31/14										
Lead	<1.0	1.0	ug/m <sup>3</sup>							
<b>LCS (B4J3014-BS1)</b> Prepared: 10/30/14 Analyzed: 10/31/14										
Lead	42.2	1.0	ug/m <sup>3</sup>	39.9		106	80-120			
<b>LCS Dup (B4J3014-BSD1)</b> Prepared: 10/30/14 Analyzed: 10/31/14										
Lead	41.9	1.0	ug/m <sup>3</sup>	39.9		105	80-120	0.928	20	



Pace Analytical Services, Inc.  
1700 Elm Street Southeast  
Minneapolis, MN 55414

Project: Analytical Services  
Project Number: 10285669  
Project Manager: Kabor Xiong

Work Order #: 1404947  
Date Reported: 11/14/14

### Notes and Definitions

< Less than value listed  
dry Sample results reported on a dry weight basis  
NA Not applicable. The %RPD is not calculated from values less than the reporting limit.  
RL Reporting Limit  
RPD Relative Percent Difference  
LCS Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)  
MS Matrix Spike = Laboratory Fortified Matrix (LFM)



# LEGEND

Technical Services, Inc.

www.legend-group.com

88 Empire Drive  
 St Paul, MN 55103  
 Tel: 651-642-1150  
 Fax: 651-642-1239

Pace Analytical Services, Inc.  
 1700 Elm Street Southeast  
 Minneapolis, MN 55414

Project: Analytical Services  
 Project Number: 10285669  
 Project Manager: Kabor Xiong

Work Order #: 1404947  
 Date Reported: 11/14/14

1404947

## Chain of Custody



Results Requested 10/31/2014

Workorder Name: Sierra Zinc

Workorder: 10285669

Kabor Xiong  
 Pace Analytical Minnesota  
 1700 Elm Street  
 Suite 200  
 Minneapolis, MN 55414  
 Phone (612)607-1700  
 Email: kabor.xiong@pacelabs.com

Legend Technical  
 P.O.

Transfers	Released By	Date/Time	Received By	Date/Time	Received on Ice	Y or N	Samples Intact	Y or N
1	Kabor Xiong	10/28/14 11:15	UK	10/28/14 14:30				
2		10/28/14 12:15		10/31/14 17:50				
3		10/31/2014 12:15						
4		10/31/2014 12:15						
5								

LAB USE ONLY

10/31  
 02  
 03

Rush due 10/31  
 sample volume to 7.5 L for all samples

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory. \*Include all data



November 14, 2014

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

RE: Project: Sierra Zinc  
Pace Project No.: 10286139

Dear Lyndsey Fox:

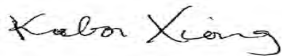
Enclosed are the analytical results for sample(s) received by the laboratory on October 21, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

Revised report on 11/14/14 to correct sample volumes per client's request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..



## SAMPLE SUMMARY

Project: Sierra Zinc

Pace Project No.: 10286139

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10286139001	SZ-AR-1-10162014	Air	10/16/14 08:16	10/21/14 10:00
10286139002	SZ-AR-2-10162014	Air	10/16/14 08:30	10/21/14 10:00
10286139003	SZ-AR-3-10162014	Air	10/16/14 09:40	10/21/14 10:00
10286139004	SZ-AR-4-10162014	Air	10/16/14 12:30	10/21/14 10:00

## REPORT OF LABORATORY ANALYSIS

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# RMC

## Laboratory Services Request Form

10286139

I. CLIENT INFORMATION		SEND REQUESTS TO:
Client Name: _____	The Goldfield Corporation	Pace Analytical
Client Address: _____	1684 W. Hibiscus Blvd.	Services, Inc.
Client Phone: _____	321.724.1700	1700 Elm St,
Client Fax: _____	321.308.1164	Minneapolis, Mn 55414
II. ACCOUNT INFORMATION		Lori Castille
Account Name: _____		Phone: (612) 607-6402
Sample Questions: _____	Lyndsey Fox RMC- 801-255-2626	Lori.Castille@pacelabs.com
TAT: _____	Standard	
P.O. No: _____	Sierra Zinc	

III. REPORT INSTRUCTIONS	
Report Results To: _____	Lyndsey Fox - RMC (lyndsey@rmc-ut.com)
Report Address: _____	Lyndsey Fox - RMC, 8496 S. Harrison St. Suite 102, MIDVALE UT 84047
Please Forward Results By: US Mail ( X ) Fed Ex ( ) Fax ( ) Email ( X )	lyndsey@rmc-ut.com (date)
Services Requested below are required no later than _____ (date)	

IV. TYPE OF SERVICE REQUESTED				
Please analyze the enclosed environmental samples for:				
Lab Use Only Lab No.	Field Sample No./Description	Sampling Date & Time	No. of Cont.	Analysis Requested
	SZ-AR-1-10162014 (Air)	10/16/2014 8:16	1	lead 001
	SZ-AR-2-10162014 ↓	↓ 8:30	1	↓ 002
	SZ-AR-3-10162014 ↓	↓ 9:46	1	↓ 003
	SZ-AR-4-10162014 ↓	↓ 12:30	1	↓ 004
notes:				


V. CHAIN OF CUSTODY RECORD			
Dispatched by: Lyndsey Fox	Date _____	Time _____	Courier Co. Name _____
Relinquished by: Lyndsey Fox <i>[Signature]</i>	Date 10/17/2014	Time 6:32 am	Airbill # T=19.2
Received by: _____	Date _____	Time _____	Custody Seal Intact?
Received for lab by: <i>[Signature]</i> PACE	Date 10-21-14	Time 1000	Yes <i>(N/A)</i> No



Sample Condition Upon Receipt

Client Name: RMC Project #: WO# : 10286139

**WO# : 10286139**



10286139

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 8313 1122 7833

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB      Temp Blank?  Yes  No

Thermom. Used:  B88A9130516413  B88A912167504  B88A9132521491      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 19.0      Cooler Temp Corrected (°C): 19.2      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: +0.2      Date and Initials of Person Examining Contents: 10-21-14/ [Signature]

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct Containers Used?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	11.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	12. <u>no time on label</u>
-Includes Date/Time/ID/Analysis Matrix: <u>A FILTER</u>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):			

CLIENT NOTIFICATION/RESOLUTION      Field Data Required?  Yes  No  
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

Project Manager Review: [Signature]      Date: Oct. 23, 2014  
 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Kabor Xiong  
Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

November 14, 2014

Report #: 1404825  
(Revised)

RE: 10286139

Dear Kabor Xiong:

Pace Analytical Services, Inc. received samples for the project identified above on October 23, 2014. The sample(s) were analyzed in the Pace-Bloomington laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: 10286139  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404825  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

### Qualifiers and Abbreviations

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: 10286139  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404825  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

### Case Narrative

This report has been revised to correct sample volumes for all samples per client request.





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: 10286139  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404825  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
SZ-AR-1-10162014	1404825-01	Air	1085	10/16/14 08:16	10/23/14 06:44
SZ-AR-2-10162014	1404825-02	Air	1062.5	10/16/14 08:30	10/23/14 06:44
SZ-AR-3-10162014	1404825-03	Air	912.5	10/16/14 09:40	10/23/14 06:44
SZ-AR-4-10162014	1404825-04	Air	480	10/16/14 12:30	10/23/14 06:44

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





1800 Elm St. SE - Suite 1830  
 Minneapolis, MN 55414  
 (612) 607-6457

Pace Analytical - MN  
 1700 Elm Street, Suite 200  
 Minneapolis, MN 55414

Client Ref: 10286139  
 Client Contact: Kabor Xiong  
 PO Number:

Report #: 1404825  
 Project Mgr: Elizabeth Kadlec  
 Account ID: 16-400130

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1404825-01</b>	<b>SZ-AR-1-10162014</b>								
Lead	< 0.92	0.92	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404825-02</b>	<b>SZ-AR-2-10162014</b>								
Lead	< 0.94	0.94	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404825-03</b>	<b>SZ-AR-3-10162014</b>								
Lead	< 1.1	1.1	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404825-04</b>	<b>SZ-AR-4-10162014</b>								
Lead	< 2.1	2.1	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





1800 Elm St. SE - Suite 1830  
 Minneapolis, MN 55414  
 (612) 607-6457

Pace Analytical - MN 1700 Elm Street, Suite 200 Minneapolis, MN 55414	Client Ref: 10286139 Client Contact: Kabor Xiong PO Number:	Report #: 1404825 Project Mgr: Elizabeth Kadlec Account ID: 16-400130
---	---	---

1404825

Chain of Custody



Workorder: 10286139      Workorder Name: LEAD      Results Requested 11/4/2014

Report/Invoice To: Kabor Xiong Pace Analytical Minnesota 1700 Elm Street Suite 200 Minneapolis, MN 55414 Phone (612)607-1700 Email: kabor.xiong@pacelabs.com		Subject/Project ID: Pace-1H Lab		P.O. _____		Requested Analysis														
Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Other	LAB USE ONLY														
1	S2-AB-1-10162014	10/16/2014 08:16	10286139001	Air																
2	S2-AB-2-10162014	10/16/2014 08:30	10286139002	Air																
3	S2-AB-3-10162014	10/16/2014 09:40	10286139003	Air																
4	S2-AB-4-10162014	10/16/2014 12:30	10286139004	Air																
5																				
Transfers		Released By	Date/Time	Received By	Date/Time	Comments														
1		Kabor Xiong	10/23/14	Bern Kadlec	10/23/14	Samples unplugged but in baggies														
2																				
3																				
Cooler Temperature on Receipt		- °C	Custody Seal	(Y) or N	Received on Ice	Y or (N)	Samples Intact (Y) or N													

\*\*\*In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.  
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



November 14, 2014

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

RE: Project: Sierra Zinc-Revised  
Pace Project No.: 10286450

Dear Lyndsey Fox:

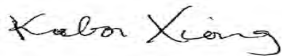
Enclosed are the analytical results for sample(s) received by the laboratory on October 23, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

Revised report on 11/14/14 to correct sample volumes per client's request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..



## SAMPLE SUMMARY

Project: Sierra Zinc-Revised

Pace Project No.: 10286450

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10286450001	SZ-AR-1-10212014	Air	10/21/14 09:14	10/23/14 09:45
10286450002	SZ-AR-2-10212014	Air	10/21/14 09:10	10/23/14 09:45
10286450003	SZ-AR-3-10212014	Air	10/21/14 09:22	10/23/14 09:45

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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**Sample Condition Upon Receipt**

Client Name: RMC Project #: \_\_\_\_\_

**WO# : 10286450**



10286450

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_  
 Tracking Number: 8313 1122 7880

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB Temp Blank?  Yes  No

Thermom. Used:  B88A9130516413  B88A912167504  B88A9132521491 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 20.9 Cooler Temp Corrected (°C): 21.4 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: 10.5 Date and Initials of Person Examining Contents: 10-23-14/AG

			Comments:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	11.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	12. <u>NO time on label</u>
-Includes Date/Time/ID/Analysis Matrix: <u>AR/Filter</u>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____			

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

Temp ok for metals.

**Project Manager Review:**

Karla Xiong

Date: Oct 27, 2014

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Kabor Xiong  
Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

November 14, 2014

Report #: 1404847  
(Revised)

RE: Sierra Zinc 10286450

Dear Kabor Xiong:

Pace Analytical Services, Inc. received samples for the project identified above on October 27, 2014. The sample(s) were analyzed in the Pace-Bloomington laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: Sierra Zinc 10286450  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404847  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

### Qualifiers and Abbreviations

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: Sierra Zinc 10286450  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404847  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

### Case Narrative

This report has been revised to correct sample volumes for all samples per client request.





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: Sierra Zinc 10286450  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404847  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
SZ-AR-1-10212014	1404847-01	Air	892.5	10/21/14 09:14	10/27/14 15:19
SZ-AR-2-10212014	1404847-02	Air	912.5	10/21/14 09:10	10/27/14 15:19
SZ-AR-3-10212014	1404847-03	Air	852.5	10/21/14 09:22	10/27/14 15:19

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





1800 Elm St. SE - Suite 1830  
 Minneapolis, MN 55414  
 (612) 607-6457

Pace Analytical - MN 1700 Elm Street, Suite 200 Minneapolis, MN 55414	Client Ref: Sierra Zinc 10286450 Client Contact: Kabor Xiong PO Number:	Report #: 1404847 Project Mgr: Elizabeth Kadlec Account ID: 16-400130
---	---	---

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1404847-01</b>	<b>SZ-AR-1-10212014</b>								
Lead	< 1.1	1.1	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404847-02</b>	<b>SZ-AR-2-10212014</b>								
Lead	< 1.1	1.1	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404847-03</b>	<b>SZ-AR-3-10212014</b>								
Lead	< 1.2	1.2	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*







November 14, 2014

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

RE: Project: Sierra Zinc-Revised  
Pace Project No.: 10286452

Dear Lyndsey Fox:

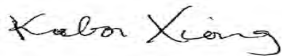
Enclosed are the analytical results for sample(s) received by the laboratory on October 23, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

Revised report on 11/14/14 to correct sample volumes per client request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10286452001	SZ-AR-1-10202014	Air	10/20/14 10:08	10/23/14 09:45
10286452002	SZ-AR-2-10202014	Air	10/20/14 10:10	10/23/14 09:45
10286452003	SZ-AR-3-10202014	Air	10/20/14 10:31	10/23/14 09:45
10286452004	SZ-AR-4-10202014	Air	10/20/14 10:28	10/23/14 09:45
10286452005	SZ-WR-10202014	Solid	10/20/14 11:39	10/23/14 09:45

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### SAMPLE ANALYTE COUNT

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10286452005	SZ-WR-10202014	EPA 6020	TT3	22	PASI-M
		EPA 7471	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

**Sample: SZ-WR-10202014**      **Lab ID: 10286452005**      Collected: 10/20/14 11:39      Received: 10/23/14 09:45      Matrix: Solid

*Results reported on a "dry-weight" basis*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3050						
Aluminum	<b>15000</b>	mg/kg	8.5	20	11/01/14 11:08	11/03/14 12:47	7429-90-5	M6
Antimony	<b>0.65</b>	mg/kg	0.42	20	11/01/14 11:08	11/03/14 12:47	7440-36-0	M6
Arsenic	<b>2.9</b>	mg/kg	0.42	20	11/01/14 11:08	11/03/14 12:47	7440-38-2	M6
Barium	<b>25.4</b>	mg/kg	0.25	20	11/01/14 11:08	11/03/14 12:47	7440-39-3	M6
Beryllium	<b>1.1</b>	mg/kg	0.17	20	11/01/14 11:08	11/03/14 12:47	7440-41-7	
Cadmium	<b>71.1</b>	mg/kg	0.068	20	11/01/14 11:08	11/03/14 12:47	7440-43-9	M6, R1
Calcium	<b>54900</b>	mg/kg	3390	2000	11/01/14 11:08	11/03/14 13:38	7440-70-2	M6
Chromium	<b>30.6</b>	mg/kg	0.42	20	11/01/14 11:08	11/03/14 12:47	7440-47-3	
Cobalt	<b>11.8</b>	mg/kg	0.42	20	11/01/14 11:08	11/03/14 12:47	7440-48-4	M6
Copper	<b>221</b>	mg/kg	0.85	20	11/01/14 11:08	11/03/14 12:47	7440-50-8	M6, R1
Iron	<b>42100</b>	mg/kg	4240	2000	11/01/14 11:08	11/03/14 13:38	7439-89-6	M6
Lead	<b>6510</b>	mg/kg	8.5	2000	11/01/14 11:08	11/03/14 13:38	7439-92-1	M6, R1
Magnesium	<b>13300</b>	mg/kg	8.5	20	11/01/14 11:08	11/03/14 12:47	7439-95-4	M6
Manganese	<b>3860</b>	mg/kg	42.4	2000	11/01/14 11:08	11/03/14 13:38	7439-96-5	M6, R1
Nickel	<b>10.4</b>	mg/kg	0.42	20	11/01/14 11:08	11/03/14 12:47	7440-02-0	M6
Potassium	<b>1560</b>	mg/kg	42.4	20	11/01/14 11:08	11/03/14 12:47	7440-09-7	M6
Selenium	ND	mg/kg	0.42	20	11/01/14 11:08	11/03/14 12:47	7782-49-2	
Silver	<b>15.1</b>	mg/kg	0.42	20	11/01/14 11:08	11/03/14 12:47	7440-22-4	M6, R1
Sodium	ND	mg/kg	42.4	20	11/01/14 11:08	11/03/14 12:47	7440-23-5	
Thallium	ND	mg/kg	0.085	20	11/01/14 11:08	11/03/14 12:47	7440-28-0	
Vanadium	<b>40.0</b>	mg/kg	0.85	20	11/01/14 11:08	11/03/14 12:47	7440-62-2	M6
Zinc	<b>18400</b>	mg/kg	424	2000	11/01/14 11:08	11/03/14 13:38	7440-66-6	M6, R1

**7471 Mercury**

Analytical Method: EPA 7471    Preparation Method: EPA 7471

Mercury	<b>0.44</b>	mg/kg	0.020	1	10/30/14 17:08	10/31/14 10:51	7439-97-6	
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**Dry Weight**

Analytical Method: ASTM D2974

Percent Moisture	<b>6.4</b>	%	0.10	1		10/31/14 10:58		
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## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

QC Batch: MERP/12008

Analysis Method: EPA 7471

QC Batch Method: EPA 7471

Analysis Description: 7471 Mercury

Associated Lab Samples: 10286452005

METHOD BLANK: 1830021

Matrix: Solid

Associated Lab Samples: 10286452005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.020	10/31/14 10:26	

LABORATORY CONTROL SAMPLE: 1830022

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.44	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1830023 1830024

Parameter	Units	10286797001		MSD		MS		MSD		% Rec Limits	Max		Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec	RPD		RPD		
Mercury	mg/kg	0.11	.53	.53	0.59	0.57	89	85	75-125	4	20		

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### QUALITY CONTROL DATA

Project: Sierra Zinc-Revised  
Pace Project No.: 10286452

QC Batch: MPRP/50159      Analysis Method: EPA 6020  
QC Batch Method: EPA 3050      Analysis Description: 6020 MET  
Associated Lab Samples: 10286452005

METHOD BLANK: 1828470      Matrix: Solid  
Associated Lab Samples: 10286452005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	8.8	11/03/14 11:39	
Antimony	mg/kg	ND	0.44	11/03/14 11:39	
Arsenic	mg/kg	ND	0.44	11/03/14 11:39	
Barium	mg/kg	ND	0.26	11/03/14 11:39	
Beryllium	mg/kg	ND	0.18	11/03/14 11:39	
Cadmium	mg/kg	ND	0.070	11/03/14 11:39	
Calcium	mg/kg	ND	35.1	11/03/14 11:39	
Chromium	mg/kg	ND	0.44	11/03/14 11:39	
Cobalt	mg/kg	ND	0.44	11/03/14 11:39	
Copper	mg/kg	ND	0.88	11/03/14 11:39	
Iron	mg/kg	ND	43.9	11/03/14 11:39	
Lead	mg/kg	ND	0.088	11/03/14 11:39	
Magnesium	mg/kg	ND	8.8	11/03/14 11:39	
Manganese	mg/kg	ND	0.44	11/03/14 11:39	
Nickel	mg/kg	ND	0.44	11/03/14 11:39	
Potassium	mg/kg	ND	43.9	11/03/14 11:39	
Selenium	mg/kg	ND	0.44	11/03/14 11:39	
Silver	mg/kg	ND	0.44	11/03/14 11:39	
Sodium	mg/kg	ND	43.9	11/03/14 11:39	
Thallium	mg/kg	ND	0.088	11/03/14 11:39	
Vanadium	mg/kg	ND	0.88	11/03/14 11:39	
Zinc	mg/kg	ND	4.4	11/03/14 11:39	

LABORATORY CONTROL SAMPLE: 1828471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	19.8	22.0	111	80-120	
Antimony	mg/kg	19.8	19.6	99	80-120	
Arsenic	mg/kg	19.8	20.2	102	80-120	
Barium	mg/kg	19.8	19.4	98	80-120	
Beryllium	mg/kg	19.8	21.2	107	80-120	
Cadmium	mg/kg	19.8	21.0	106	80-120	
Calcium	mg/kg	248	268	108	80-120	
Chromium	mg/kg	19.8	20.6	104	80-120	
Cobalt	mg/kg	19.8	20.6	104	80-120	
Copper	mg/kg	19.8	20.9	106	80-120	
Iron	mg/kg	248	283	114	80-120	
Lead	mg/kg	19.8	20.1	101	80-120	
Magnesium	mg/kg	248	269	109	80-120	
Manganese	mg/kg	19.8	20.0	101	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc-Revised  
Pace Project No.: 10286452

LABORATORY CONTROL SAMPLE: 1828471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	mg/kg	19.8	20.4	103	80-120	
Potassium	mg/kg	248	253	102	80-120	
Selenium	mg/kg	19.8	20.1	101	80-120	
Silver	mg/kg	19.8	20.8	105	80-120	
Sodium	mg/kg	248	265	107	80-120	
Thallium	mg/kg	19.8	21.1	106	80-120	
Vanadium	mg/kg	19.8	20.3	102	80-120	
Zinc	mg/kg	19.8	20.8	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828472 1828473

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10286452005 Result	Spike Conc.	Spike Conc.	MSD Result							
Aluminum	mg/kg	15000	17.4	17.4	19400	19000	25600	22900	75-125	2	20	M6
Antimony	mg/kg	0.65	17.4	17.4	9.3	10.5	50	57	75-125	12	20	M6
Arsenic	mg/kg	2.9	17.4	17.4	29.0	27.0	150	139	75-125	7	20	M6
Barium	mg/kg	25.4	17.4	17.4	54.3	50.7	167	146	75-125	7	20	M6
Beryllium	mg/kg	1.1	17.4	17.4	20.5	22.6	112	124	75-125	10	20	
Cadmium	mg/kg	71.1	17.4	17.4	299	102	1310	175	75-125	99	20	M6, R1
Calcium	mg/kg	54900	217	217	63000	56600	3710	787	75-125	11	20	M6
Chromium	mg/kg	30.6	17.4	17.4	45.9	51.6	88	121	75-125	12	20	
Cobalt	mg/kg	11.8	17.4	17.4	30.4	37.2	107	146	75-125	20	20	M6
Copper	mg/kg	221	17.4	17.4	744	235	3010	85	75-125	104	20	M6, R1
Iron	mg/kg	42100	217	217	69000	69800	12400	12700	75-125	1	20	M6
Lead	mg/kg	6510	17.4	17.4	19500	5110	74800	-8050	75-125	117	20	E, M6, R1
Magnesium	mg/kg	13300	217	217	19000	17300	2630	1860	75-125	9	20	M6
Manganese	mg/kg	3860	17.4	17.4	14800	8560	63100	27100	75-125	54	20	E, M6, R1
Nickel	mg/kg	10.4	17.4	17.4	31.6	33.4	122	132	75-125	6	20	M6
Potassium	mg/kg	1560	217	217	2280	2390	331	384	75-125	5	20	M6
Selenium	mg/kg	ND	17.4	17.4	18.6	20.2	105	114	75-125	8	20	
Silver	mg/kg	15.1	17.4	17.4	80.6	40.0	377	143	75-125	67	20	M6, R1
Sodium	mg/kg	ND	217	217	271	298	107	120	75-125	9	20	
Thallium	mg/kg	ND	17.4	17.4	19.4	20.5	111	118	75-125	6	20	
Vanadium	mg/kg	40.0	17.4	17.4	52.1	62.6	69	130	75-125	18	20	M6
Zinc	mg/kg	18400	17.4	17.4	74700	22600	324000	24200	75-125	107	20	E, M6, R1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

QC Batch: MPRP/50261

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10286452005

SAMPLE DUPLICATE: 1831974

Parameter	Units	10285265001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	55.5	56.9	2	30	

SAMPLE DUPLICATE: 1831975

Parameter	Units	10287083001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.9	14.4	4	30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Sierra Zinc-Revised

Pace Project No.: 10286452

---

<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10286452005	SZ-WR-10202014	EPA 3050	MPRP/50159	EPA 6020	ICPM/22344
10286452005	SZ-WR-10202014	EPA 7471	MERP/12008	EPA 7471	MERC/13887
10286452005	SZ-WR-10202014	ASTM D2974	MPRP/50261		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition  
Upon Receipt

Client Name: RMC

Project #: \_\_\_\_\_

**WO# : 10286452**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_  
 Tracking Number: 8313 1122 7822

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB      Temp Blank?  Yes  No

Thermom. Used:  B88A9130516413  B88A912167504  B88A9132521491      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 18.2      Cooler Temp Corrected (°C): 18.4      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: +0.2      Date and Initials of Person Examining Contents: 10-23-14/116

Comments:

Chain of Custody Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	11.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>Filter AR1 SL</u>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____			

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: Temp ok for metal analysis.

Project Manager Review: Kalu Xiang

Date: Oct. 27 2014

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e out of hold, incorrect preservative, out of temp, incorrect containers)





Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Kabor Xiong  
Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

November 14, 2014

Report #: 1404849  
(Revised)

RE: Sierra Zinc 10286452

Dear Kabor Xiong:

Pace Analytical Services, Inc. received samples for the project identified above on October 27, 2014. The sample(s) were analyzed in the Pace-Bloomington laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: Sierra Zinc 10286452  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404849  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

### Qualifiers and Abbreviations

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





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Minneapolis, MN 55414  
(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: Sierra Zinc 10286452  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404849  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

### Case Narrative

This report has been revised to correct sample volumes for all samples per client request.





1800 Elm St. SE - Suite 1830  
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(612) 607-6457

Pace Analytical - MN  
1700 Elm Street, Suite 200  
Minneapolis, MN 55414

Client Ref: Sierra Zinc 10286452  
Client Contact: Kabor Xiong  
PO Number:

Report #: 1404849  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400130

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
SZ-AR-1-10202014	1404849-01	Air	782.5	10/20/14 10:08	10/27/14 15:21
SZ-AR-2-10202014	1404849-02	Air	787.5	10/20/14 10:10	10/27/14 15:21
SZ-AR-3-10202014	1404849-03	Air	502.5	10/20/14 10:31	10/27/14 15:21
SZ-AR-4-10202014	1404849-04	Air	720	10/20/14 10:28	10/27/14 15:21

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 Minneapolis, MN 55414  
 (612) 607-6457

Pace Analytical - MN  
 1700 Elm Street, Suite 200  
 Minneapolis, MN 55414

Client Ref: Sierra Zinc 10286452  
 Client Contact: Kabor Xiong  
 PO Number:

Report #: 1404849  
 Project Mgr: Elizabeth Kadlec  
 Account ID: 16-400130

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1404849-01</b>	<b>SZ-AR-1-10202014</b>								
Lead	< 1.3	1.3	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404849-02</b>	<b>SZ-AR-2-10202014</b>								
Lead	< 1.3	1.3	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404849-03</b>	<b>SZ-AR-3-10202014</b>								
Lead	< 2.0	2.0	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	
<b>1404849-04</b>	<b>SZ-AR-4-10202014</b>								
Lead	< 1.4	1.4	ug/m <sup>3</sup>	1	10/30/14	11/3/14	CJS	NIOSH 7303	

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Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Lyndsey Fox  
Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

November 14, 2014

Report #: 1404920  
(Revised)

RE: Sierra Zinc

Dear Lyndsey Fox:

Pace Analytical Services, Inc. received samples for the project identified above on November 04, 2014. The sample(s) were analyzed in the Pace-Bloomington laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404920  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

### Qualifiers and Abbreviations

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

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(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404920  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

### Case Narrative

This report has been revised to correct sample volumes for all samples per client request.

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Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404920  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
#1 D6 Dozer	1404920-01	Air	600	10/30/14 12:30	11/04/14 13:11
#2 Nixon Fence	1404920-02	Air	607.5	10/30/14 12:35	11/04/14 13:11
#3 Silt Fence	1404920-03	Air	600	10/30/14 12:45	11/04/14 13:11

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 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1404920 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
---	--	---

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1404920-01</b>	<b>#1 D6 Dozer</b>								
Lead	< 1.7	1.7	ug/m <sup>3</sup>	1	11/4/14	11/5/14	CJS	NIOSH 7303	
<b>1404920-02</b>	<b>#2 Nixon Fence</b>								
Lead	< 1.6	1.6	ug/m <sup>3</sup>	1	11/4/14	11/5/14	CJS	NIOSH 7303	
<b>1404920-03</b>	<b>#3 Silt Fence</b>								
Lead	< 1.7	1.7	ug/m <sup>3</sup>	1	11/4/14	11/5/14	CJS	NIOSH 7303	

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 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1404920 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
---	--	---

**RMC**  
Laboratory Services Request Form

1404920

002/002

<b>CLIENT INFORMATION</b>				<b>SEND REQUESTS TO:</b>	
Client Name: <u>The Goldfield Corporation</u>				Pace Analytical	
Client Address: <u>1684 W. Hibiscus Blvd.</u>				Services, Inc.	
Client Phone: <u>321.724.1700</u>				1800 Elm St,	
Client Fax: <u>321.308.1184</u>				Minneapolis MN 55414	
<b>ACCOUNT INFORMATION</b>				Beth Kadlec	
Account Name: <u>Sierra Zinc</u>				Phone: (612) 607-6457	
Sample Questions: <u>Lyndsey Fox</u> RMC- 801-255-2626					
TAT: <u>RUSH</u>					
P.O. No: <u>Sierra Zinc</u>				Beth.Kadlec@pacelabs.com	
<b>III. REPORT INSTRUCTIONS</b>					
Report Results To: <u>Lyndsey - RMC (lyndsey@rmo-ut.com)</u>					
Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street Suite 102, MIDVALE UT 84047</u>					
Please Forward Results By: US Mail (X) Fed Ex ( ) Fax ( ) Email (X) <u>lyndsey@rmo-ut.com</u>					
Services Requested below are required no later than <u>(date)</u>					
<b>IV. TYPE OF SERVICE REQUESTED</b>					
Please analyze the enclosed environmental samples for:					
Field Sample No./Description	Sampling Date & Time	Volume	No. of Cont.	Analysis Requested	
#1 <u>Nixon Fence WG Dozer</u>	<u>10/30/14 1230</u>	<u>2.5L Ph, 4hrs</u>	<u>1</u>	<u>As lead</u>	
#2 <u>Nixon Fence</u>	<u>11/30/14 1235</u>	<u>S S S</u>	<u>1</u>	<u>S</u>	
#3 <u>S.H Fence</u>	<u>11/30/14 1240</u>	<u>S S S</u>	<u>1</u>	<u>S</u>	
notes: <u>Please CC Jim Fricks with Questions and results (jim@rmo-ut.com)</u>					
<b>V. CHAIN OF CUSTODY RECORD</b>					
Dispatched by:	Date	Time	Counter Co. Name		
Refriniquished by: <u>[Signature]</u>	Date <u>10/31/14</u>	Time <u>1040</u>	Atrbill #		
Received by:	Date	Time	Custody Seal Intact? <u>NA</u>		
Received for lab by: <u>Beth Kadlec</u> <u>Rec/HA</u>	Date <u>11/4/14</u>	Time <u>13:11</u>	Yes No		

10/29/2014 13:27 FAX 801.255.3266

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Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Lyndsey Fox  
Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

November 14, 2014

Report #: 1404951  
(Revised)

RE: Sierra Zinc

Dear Lyndsey Fox:

Pace Analytical Services, Inc. received samples for the project identified above on November 07, 2014. The sample(s) were analyzed in the Pace-Bloomington laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404951  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

### **Qualifiers and Abbreviations**

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404951  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

### Case Narrative

This report has been revised to correct sample volumes for all samples per client request.

*The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1404951  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
#1 Nixon Fence	1404951-01	Air	10	11/05/14 11:00	11/07/14 14:14
#2 Museum Fence	1404951-02	Air	10	11/05/14 11:05	11/07/14 14:14
#3 Water Tower	1404951-03	Air	10	11/05/14 11:10	11/07/14 14:14

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1800 Elm St. SE - Suite 1830  
 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1404951 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
---	--	---

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1404951-01</b>	<b>#1 Nixon Fence</b>								
Lead	< 1.6	1.6	ug/m <sup>3</sup>	1	11/10/14	11/10/14	CJS	NIOSH 7303	
<b>1404951-02</b>	<b>#2 Museum Fence</b>								
Lead	< 1.6	1.6	ug/m <sup>3</sup>	1	11/10/14	11/10/14	CJS	NIOSH 7303	
<b>1404951-03</b>	<b>#3 Water Tower</b>								
Lead	< 1.6	1.6	ug/m <sup>3</sup>	1	11/10/14	11/10/14	CJS	NIOSH 7303	

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1800 Elm St. SE - Suite 1830  
 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1404951 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
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**RMC**  
 Laboratory Services Request Form

002/002

1404951

<b>CLIENT INFORMATION</b>					<b>SEND REQUESTS TO:</b>	
Client Name: <u>The Goldfield Corporation</u>					Pace Analytical	
Client Address: <u>1684 W. Hibiscus Blvd.</u>					Services, Inc.	
Client Phone: <u>321.724.1700</u>					1800 Elm St,	
Client Fax: <u>321.308.1164</u>					Minneapolis MN 55414	
<b>ACCOUNT INFORMATION</b>					Beth Kadlec	
Account Name: <u>Sierra Zinc</u>					Phone: (612) 607-6457	
Sample Questions: <u>Lyndsey Fox</u> <u>RMC- 601-255-2826</u>						
TAT: <u>RUSH</u>						
P.O. No: <u>Sierra Zinc</u>					Beth.Kadlec@pacelabs.com	
<b>REPORT INSTRUCTIONS</b>						
Report Results To: <u>Lyndsey - RMC (lyndsey@rmc-ut.com)</u>						
Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street Suite 102, MIDVALE UT 84047</u>						
Please Forward Results By: US Mail (X) Fed Ex ( ) Fax ( ) Email (X) <u>lyndsey@rmc-ut.com</u>						
Services Requested below are required no later than _____ (date)						
<b>TYPE OF SERVICE REQUESTED</b>						
Please analyze the enclosed environmental samples for:						
Field Sample No./Description	Sampling Date & Time	Volume	No. of Cont.	Analysis Requested		
140495-01 #1 Dixon Fence	11/5/14 - 1100	2.5 L/H @ 4WS	1	Pb		
02 #2 Museum Fence	1105	5	1			
03 #3 Water Tower	1100	5	1			
notes: <u>Please CC Jim Fricke with Questions and results (jim@rmc-ut.com)</u>						
<b>CHAIN OF CUSTODY RECORD</b>						
Dispatched by: <u>[Signature]</u>	Date: <u>11/6/14</u>	Time: <u>01750</u>	Courier Co. Name			
Relinquished by: <u>[Signature]</u>	Date: <u>11/7/14</u>	Time: <u>14:14</u>	Airbill #			
Received by: <u>Bern Kadlec</u>	Date: <u>11/7/14</u>	Time: <u>14:14</u>	Custody Seal Intact?			
			Yes No			

10/29/2014 13:27 FAX 8012553266

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Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Lyndsey Fox  
Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

November 17, 2014

Report #: 1405002

RE: Sierra Zinc

Dear Lyndsey Fox:

Pace Analytical Services, Inc. received samples for the project identified above on November 13, 2014. The sample(s) were analyzed in the Pace Industrial Hygiene laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1405002  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

### **Qualifiers and Abbreviations**

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

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1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1405002  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
SZ-AR-1-11112014	1405002-01	Air	1395	11/11/14 07:32	11/13/14 10:15
SZ-AR-2-11112014	1405002-02	Air	1392	11/11/14 07:35	11/13/14 10:15
SZ-AR-3-11112014	1405002-03	Air	1150	11/11/14 07:40	11/13/14 10:15

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 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1405002 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
---	--	---

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1405002-01</b>	<b>SZ-AR-1-11112014</b>								
Lead	< 0.72	0.72	ug/m <sup>3</sup>	1	11/13/14	11/14/14	CJS	NIOSH 7303	
<b>1405002-02</b>	<b>SZ-AR-2-11112014</b>								
Lead	< 0.72	0.72	ug/m <sup>3</sup>	1	11/13/14	11/14/14	CJS	NIOSH 7303	
<b>1405002-03</b>	<b>SZ-AR-3-11112014</b>								
Lead	< 0.87	0.87	ug/m <sup>3</sup>	1	11/13/14	11/14/14	CJS	NIOSH 7303	

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1800 Elm St. SE - Suite 1830  
 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1405002 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
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**RMC**  
Laboratory Services Request Form

1405002

002/002  
KMS  
0912000ZDD  
10:21 FAA  
0912000ZDD

<b>CLIENT INFORMATION</b>					<b>SEND REQUESTS TO:</b> Pace Analytical Services, Inc. 1800 Elm St, Minneapolis MN 55414  Beth Kadlec Phone: (612) 607-6457
Client Name: <u>The Goldfield Corporation</u>					
Client Address: <u>1884 W. Hibiscus Blvd. Melbourne Florida</u>					
Client Phone: <u>321.724.1700</u> Client Fax: <u>321.308.1184</u>					
<b>ACCOUNT INFORMATION</b>					
Account Name: <u>Sierra Zinc</u>					
Sample Questions: <u>Lyndsey Fox RMC-801-254-2828</u>					
TAT: <u>RUSH - 48 hrs</u>					
P.O. No: <u>Sierra Zinc</u>					
<b>REPORT INSTRUCTIONS</b>					
Report Results To: <u>Lyndsey - RMC (lyndsey@rmo-ut.com)</u>					
Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street Suite 102, MIDVALE UT 84047</u>					
Please Forward Results By: <input checked="" type="checkbox"/> US Mail <input type="checkbox"/> Fed Ex <input type="checkbox"/> Fax <input type="checkbox"/> Email <input checked="" type="checkbox"/>					
Services Requested below are required no later than _____ lyndsey@rmo-ut.com (date)					
<b>TYPE OF SERVICE REQUESTED</b>					
Please analyze the enclosed environmental samples for:					
Lab Use Date Lab No.	Field Sample No./Description	Sampling Date & Time	Volume	No. of Cont.	Analysis Requested
	SZ-AR-1-11112014	11/11/2014 7:32 am	23.25 liters (7:32-3:17 x 31PF)	1	Lead
	SZ-AR-2-11112014	7:35 am	23.25 liters (7:35-3:19 x 31PF)	1	(NICKEL 70S)
	SZ-AR-3-11112014	7:40 am	19 liters (7:40-3:20 x)	1	
notes: <u>Please CC Jim Fricke with Questions and results (Jim@rmo-ut.com)</u>					
<b>CHAIN OF CUSTODY RECORD</b>					
Dispatched by:	Date	Time	Courier Co. Name		
Relinquished by: <u>Lyndsey Fox</u>	Date: <u>11/11/2014</u>	Time: <u>6:15 pm</u>	Airbill #		
Received by:	Date	Time	Custody Seal Intact?		
Received for lab by: <u>Beth Kadlec</u>	Date: <u>11/11/14</u>	Time: <u>10:15</u>	Yes No		

unplugged but in baggies

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Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Lyndsey Fox  
Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

November 18, 2014

Report #: 1405015

RE: Sierra Zinc

Dear Lyndsey Fox:

Pace Analytical Services, Inc. received samples for the project identified above on November 14, 2014. The sample(s) were analyzed in the Pace Industrial Hygiene laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec". The signature is written in a cursive, flowing style.

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1405015  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

### Qualifiers and Abbreviations

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

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1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1405015  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
SZ-AR-1-11122014	1405015-01	Air	1395	11/12/14 07:32	11/14/14 13:15
SZ-AR-2-11122014	1405015-02	Air	1362	11/12/14 07:45	11/14/14 13:15
SZ-AR-3-11122014	1405015-03	Air	1320	11/12/14 07:52	11/14/14 13:15

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 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1405015 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
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Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1405015-01</b>	<b>SZ-AR-1-11122014</b>								
Lead	< 0.72	0.72	ug/m <sup>3</sup>	1	11/17/14	11/17/14	CJS	NIOSH 7303	
<b>1405015-02</b>	<b>SZ-AR-2-11122014</b>								
Lead	< 0.73	0.73	ug/m <sup>3</sup>	1	11/17/14	11/17/14	CJS	NIOSH 7303	
<b>1405015-03</b>	<b>SZ-AR-3-11122014</b>								
Lead	< 0.76	0.76	ug/m <sup>3</sup>	1	11/17/14	11/17/14	CJS	NIOSH 7303	

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 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1405015 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
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**RMC**  
 Laboratory Services Request Form

10/29/2014 13:27 FAX 8012553286

1405015

<b>CLIENT INFORMATION</b>		<b>SEND REQUESTS TO:</b>		
Client Name: <u>The Goldfield Corporation</u>	Client Address: <u>1884 W. Hibiscus Blvd. Melbourne Florida</u>	Pace Analytical Services, Inc. 1800 Elm St, Minneapolis MN 55414		
Client Phone: <u>321.724.1700</u>	Client Fax: <u>321.308.1184</u>	Beth Kadlec Phone: (612) 607-6457		
<b>ACCOUNT INFORMATION</b>				
Account Name: <u>Sierra Zinc</u>	Sample Questions: <u>Lyndsey Fox RMC-801-255-2828</u>			
TAT: <u>RUSH - 48 hour</u>				
P.O. No: <u>Sierra Zinc</u>	Beth.Kadlec@paceanaly.com			
<b>REPORT INSTRUCTIONS</b>				
Report Results To: <u>Lyndsey - RMC (lyndsey@rmo-ut.com)</u>				
Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street Suite 102, MIDVALE UT 84047</u>				
Please Forward Results By: <input checked="" type="checkbox"/> US Mail <input type="checkbox"/> Fed Ex <input type="checkbox"/> Fax <input type="checkbox"/> Email <input checked="" type="checkbox"/>				
Services Requested below are required no later than _____ (date)				
<b>TYPE OF SERVICE REQUESTED</b>				
Please analyze the enclosed environmental samples for:				
Field Sample No./Description	Sampling Date & Time	Volume	No. of Cont.	Analysis Requested
<u>1405015-01 SZ-AR-1-11/2/2014</u>	<u>11/2/2014</u>	<u>7:32-3:17pm @ 3 LPH</u>	<u>1</u>	
<u>02 SZ-AR-2-11/2/2014</u>	<u>7:45am</u>	<u>7:45am-3:14pm @ 3 LPH</u>	<u>1</u>	<u>LEAD</u>
<u>03 SZ-AR-3-11/2/2014</u>	<u>7:52am</u>	<u>7:52am-3:12pm @ 3 LPH</u>	<u>1</u>	<u>(NITROGEN 10.3)</u>
Notes: <u>Please CC Jim Fricke with Questions and results (jmf@rmo-ut.com)</u>				
<b>CHAIN OF CUSTODY RECORD</b>				
Dispatched by: <u>[Signature]</u>	Date: <u>11/2/2013</u>	Time: _____	Counter Co. Name	
Relinquished by: _____	Date: _____	Time: _____	Asst #	
Received by: _____	Date: _____	Time: _____	Custody Seal Intact?	
Received for lab by: <u>Beth Kadlec</u>	Date: <u>11/11/14</u>	Time: <u>13:15</u>	Yes No	

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Pace Analytical Services, Inc.  
1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Lyndsey Fox  
Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

November 25, 2014

Report #: 1405071

RE: Sierra Zinc

Dear Lyndsey Fox:

Pace Analytical Services, Inc. received samples for the project identified above on November 21, 2014. The sample(s) were analyzed in the Pace Industrial Hygiene laboratory unless otherwise noted. Analytical results are summarized in the following report.

All routine quality assurance procedures were followed, unless otherwise noted.

Analytical results are reported on an "as received" basis unless otherwise noted. Where possible, the samples will be retained by the laboratory for 14 days following issuance of the initial final report. The samples will be disposed of or returned at that time. Arrangements can be made for extended storage by contacting me at this time.

We appreciate your decision to use Pace Analytical Services, Inc. for this project. We are committed to being your vendor of choice to meet your analytical chemistry needs.

If you have any questions please contact me at the above phone number.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth Kadlec".

Elizabeth Kadlec  
Project Manager





1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1405071  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

### Qualifiers and Abbreviations

COC	Chain of Custody
MRL	Method Reporting Limit
ppm	Parts per million in Air
NA	Not Applicable
NR	Not Reported
%Rec	Percent Recovery
RPD	Relative Percent Difference

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1800 Elm St. SE - Suite 1830  
Minneapolis, MN 55414  
(612) 607-6457

Resource Management Consultant  
8496 S Harrison Street Suite 102  
Midvale, UT 84047

Client Ref: Sierra Zinc  
Client Contact: Lyndsey Fox  
PO Number:

Report #: 1405071  
Project Mgr: Elizabeth Kadlec  
Account ID: 16-400148

**Sample Summary**

Sample ID	Laboratory ID	Matrix	Air Volume (L) or Time (Min)	Date Sampled	Date Received
SZ-AR-1-11172014	1405071-01	Air	1247.5	11/17/14 07:12	11/21/14 10:15
SZ-AR-2-11172014	1405071-02	Air	1245	11/17/14 07:16	11/21/14 10:15
SZ-AR-3-11172014	1405071-03	Air	1245	11/17/14 07:24	11/21/14 10:15
SZ-AR-1-11182014	1405071-04	Air	1277.5	11/18/14 07:12	11/21/14 10:15
SZ-AR-2-11182014	1405071-05	Air	1267.5	11/18/14 07:14	11/21/14 10:15
SZ-AR-3-11182014	1405071-06	Air	1242.5	11/18/14 07:21	11/21/14 10:15

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 Minneapolis, MN 55414  
 (612) 607-6457

Resource Management Consultant  
 8496 S Harrison Street Suite 102  
 Midvale, UT 84047

Client Ref: Sierra Zinc  
 Client Contact: Lyndsey Fox  
 PO Number:

Report #: 1405071  
 Project Mgr: Elizabeth Kadlec  
 Account ID: 16-400148

Analyte	Result	MRL	Units	Dilution	Prepared	Analyzed	Analyst	Method	Notes
<b>Pace Analytical Services, Inc. (</b>									
<b>1405071-01</b>	<b>SZ-AR-1-11172014</b>								
Lead	< 0.80	0.80	ug/m <sup>3</sup>	1	11/21/14	11/24/14	CJS	NIOSH 7303	
<b>1405071-02</b>	<b>SZ-AR-2-11172014</b>								
Lead	< 0.80	0.80	ug/m <sup>3</sup>	1	11/21/14	11/24/14	CJS	NIOSH 7303	
<b>1405071-03</b>	<b>SZ-AR-3-11172014</b>								
Lead	< 0.80	0.80	ug/m <sup>3</sup>	1	11/21/14	11/24/14	CJS	NIOSH 7303	
<b>1405071-04</b>	<b>SZ-AR-1-11182014</b>								
Lead	< 0.78	0.78	ug/m <sup>3</sup>	1	11/21/14	11/24/14	CJS	NIOSH 7303	
<b>1405071-05</b>	<b>SZ-AR-2-11182014</b>								
Lead	< 0.79	0.79	ug/m <sup>3</sup>	1	11/21/14	11/24/14	CJS	NIOSH 7303	
<b>1405071-06</b>	<b>SZ-AR-3-11182014</b>								
Lead	< 0.80	0.80	ug/m <sup>3</sup>	1	11/21/14	11/24/14	CJS	NIOSH 7303	

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 (612) 607-6457

Resource Management Consultant 8496 S Harrison Street Suite 102 Midvale, UT 84047	Client Ref: Sierra Zinc Client Contact: Lyndsey Fox PO Number:	Report #: 1405071 Project Mgr: Elizabeth Kadlec Account ID: 16-400148
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**RMC**  
Laboratory Services Request Form

990007/004

RMC

10/29/2014 13:27 FAX 8012553266

<b>CLIENT INFORMATION</b>				<b>SEND REQUESTS TO:</b>	
Client Name: <u>The Goldfield Corporation</u>		Client Address: <u>1884 W. Hibiscus Blvd, Melbourne Florida 32901</u>		Pace Analytical Services, Inc. 1800 Elm St, Minneapolis MN 55414	
Client Phone: <u>321.724.1700</u>		Client Fax: <u>321.306.1164</u>		Bath Kadtac Phone: (612) 607-6457	
<b>ACCOUNT INFORMATION</b>					
Account Name: <u>Sierra Zinc</u>		Sample Questions: <u>Lyndsey Fox RMC-801-268-2826</u>			
TAT: <u>RUSH (48 hrs)</u>				P.O. No: <u>Sierra Zinc</u>	
<b>REPORT INSTRUCTIONS</b>					
Report Results To: <u>Lyndsey Fox - RMC (lyndsey@rmc-wi.com)</u>		Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street Suite 102, MIDVALE UT 84047</u>		Please Forward Results By: <input checked="" type="checkbox"/> US Mail (X) <input type="checkbox"/> Fed Ex ( ) <input type="checkbox"/> Fax ( ) <input checked="" type="checkbox"/> Email (X)	
Services Requested below are required no later than				jmc@rmc-wi.com lyndsey@rmc-wi.com (date)	
<b>TYPE OF SERVICE REQUESTED</b>					
Please analyze the enclosed environmental samples for:					
Field Sample No./Description	Sampling Date & Time	Volume	No. of Cont.	Analysis Requested	
SZ-AR-1-11172014	11/17/14 7:12 am	7:12 am - 3:34 pm @ 2.5 LPM	1	1247.5L	
SZ-AR-2-11172014	7:16 am	7:16 am - 3:34 pm @ 2.5 LPM	1	1245L LEAD	
SZ-AR-3-11172014	7:24 am	7:24 am - 3:42 pm @ 2.5 LPM	1	1245L (NITROGEN 703)	
SZ-AR-1-11182014	11/18/2014	7:12 am - 3:43 pm 2.5 LPM	1	1277.5L	
SZ-AR-2-11182014		7:14 am - 3:41 pm	1	1267.5L	
SZ-AR-3-11182014		7:21 am - 3:38 pm	1	1245.5L 1244 1242.5L	
notes: <u>Please CC Jim Ficke with Questions and results (jim@rmc-wi.com)</u>					
<b>CHAIN OF CUSTODY RECORD</b>					
Dispatched by: <u>[Signature]</u>	Date: <u>11/18/2014</u>	Time: <u>3:48 pm</u>	Counter Co. Name		
Relinquished by:	Date:	Time:	Airbill #		
Received by:	Date:	Time:	Custody Seal Intact?		
Received for lab by: <u>Sean Kalle</u>	Date: <u>11/21/14</u>	Time: <u>10:15 am</u>	Yes	No	

The results in this report apply only to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



December 09, 2014

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

RE: Project: Sierra Zinc- REV  
Pace Project No.: 10289747

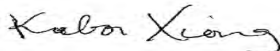
Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on November 21, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Report revised on 12/09/14: correct sample ID per clients request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Sierra Zinc- REV

Pace Project No.: 10289747

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: Sierra Zinc- REV

Pace Project No.: 10289747

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10289747001	SZ-SO-Assay 4-11182014	Solid	11/18/14 13:41	11/21/14 09:45

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### SAMPLE ANALYTE COUNT

Project: Sierra Zinc- REV

Pace Project No.: 10289747

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10289747001	SZ-SO-Assay 4-11182014	EPA 6020	RJS	22	PASI-M
		EPA 7471	DM	1	PASI-M
		ASTM D2974	AMP	1	PASI-M

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## ANALYTICAL RESULTS

Project: Sierra Zinc- REV

Pace Project No.: 10289747

**Sample: SZ-SO-Assay 4-11182014**    **Lab ID: 10289747001**    Collected: 11/18/14 13:41    Received: 11/21/14 09:45    Matrix: Solid

**Results reported on a "dry-weight" basis**

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3050						
Aluminum	<b>17400</b>	mg/kg	10.6	20	12/01/14 12:04	12/03/14 12:37	7429-90-5	
Antimony	ND	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7440-36-0	
Arsenic	<b>3.6</b>	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7440-38-2	
Barium	<b>147</b>	mg/kg	0.32	20	12/01/14 12:04	12/03/14 12:37	7440-39-3	
Beryllium	<b>0.52</b>	mg/kg	0.21	20	12/01/14 12:04	12/03/14 12:37	7440-41-7	
Cadmium	<b>1.5</b>	mg/kg	0.085	20	12/01/14 12:04	12/03/14 12:37	7440-43-9	
Calcium	<b>3620</b>	mg/kg	42.4	20	12/01/14 12:04	12/03/14 12:37	7440-70-2	
Chromium	<b>8.7</b>	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7440-47-3	
Cobalt	<b>4.5</b>	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7440-48-4	
Copper	<b>14.1</b>	mg/kg	1.1	20	12/01/14 12:04	12/03/14 12:37	7440-50-8	
Iron	<b>13600</b>	mg/kg	53.0	20	12/01/14 12:04	12/03/14 12:37	7439-89-6	
Lead	<b>65.9</b>	mg/kg	0.11	20	12/01/14 12:04	12/03/14 12:37	7439-92-1	
Magnesium	<b>2980</b>	mg/kg	10.6	20	12/01/14 12:04	12/03/14 12:37	7439-95-4	
Manganese	<b>298</b>	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7439-96-5	
Nickel	<b>8.7</b>	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7440-02-0	
Potassium	<b>883</b>	mg/kg	53.0	20	12/01/14 12:04	12/03/14 12:37	7440-09-7	
Selenium	ND	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7782-49-2	
Silver	ND	mg/kg	0.53	20	12/01/14 12:04	12/03/14 12:37	7440-22-4	
Sodium	<b>137</b>	mg/kg	53.0	20	12/01/14 12:04	12/03/14 12:37	7440-23-5	
Thallium	<b>0.11</b>	mg/kg	0.11	20	12/01/14 12:04	12/03/14 12:37	7440-28-0	
Vanadium	<b>21.9</b>	mg/kg	1.1	20	12/01/14 12:04	12/03/14 12:37	7440-62-2	
Zinc	<b>472</b>	mg/kg	5.3	20	12/01/14 12:04	12/03/14 12:37	7440-66-6	
<b>7471 Mercury</b>		Analytical Method: EPA 7471    Preparation Method: EPA 7471						
Mercury	<b>0.038</b>	mg/kg	0.024	1	11/29/14 10:54	12/01/14 11:43	7439-97-6	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>18.0</b>	%	0.10	1		12/08/14 09:59		

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### QUALITY CONTROL DATA

Project: Sierra Zinc- REV  
Pace Project No.: 10289747

QC Batch: MERP/12227      Analysis Method: EPA 7471  
QC Batch Method: EPA 7471      Analysis Description: 7471 Mercury  
Associated Lab Samples: 10289747001

METHOD BLANK: 1852965      Matrix: Solid  
Associated Lab Samples: 10289747001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.019	12/01/14 11:25	

LABORATORY CONTROL SAMPLE: 1852966

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.42	0.45	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1852967      1852968

Parameter	Units	10289303001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	.5	.49	0.50	0.46	97	92	75-125	8	20	

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### QUALITY CONTROL DATA

Project: Sierra Zinc- REV

Pace Project No.: 10289747

QC Batch:	MPRP/50895	Analysis Method:	EPA 6020
QC Batch Method:	EPA 3050	Analysis Description:	6020 MET
Associated Lab Samples:	10289747001		

METHOD BLANK: 1854718 Matrix: Solid

Associated Lab Samples: 10289747001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.5	12/03/14 11:28	
Antimony	mg/kg	ND	0.48	12/03/14 11:28	
Arsenic	mg/kg	ND	0.48	12/03/14 11:28	
Barium	mg/kg	ND	0.29	12/03/14 11:28	
Beryllium	mg/kg	ND	0.19	12/03/14 11:28	
Cadmium	mg/kg	ND	0.076	12/03/14 11:28	
Calcium	mg/kg	ND	38.1	12/03/14 11:28	
Chromium	mg/kg	ND	0.48	12/03/14 11:28	
Cobalt	mg/kg	ND	0.48	12/03/14 11:28	
Copper	mg/kg	ND	0.95	12/03/14 11:28	
Iron	mg/kg	ND	47.6	12/03/14 11:28	
Lead	mg/kg	ND	0.095	12/03/14 11:28	
Magnesium	mg/kg	ND	9.5	12/03/14 11:28	
Manganese	mg/kg	ND	0.48	12/03/14 11:28	
Nickel	mg/kg	ND	0.48	12/03/14 11:28	
Potassium	mg/kg	ND	47.6	12/03/14 11:28	
Selenium	mg/kg	ND	0.48	12/03/14 11:28	
Silver	mg/kg	ND	0.48	12/03/14 11:28	
Sodium	mg/kg	ND	47.6	12/03/14 11:28	
Thallium	mg/kg	ND	0.095	12/03/14 11:28	
Vanadium	mg/kg	ND	0.95	12/03/14 11:28	
Zinc	mg/kg	ND	4.8	12/03/14 11:28	

LABORATORY CONTROL SAMPLE: 1854719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	18.3	20.6	112	80-120	
Antimony	mg/kg	18.3	18.2	99	80-120	
Arsenic	mg/kg	18.3	17.7	96	80-120	
Barium	mg/kg	18.3	18.3	100	80-120	
Beryllium	mg/kg	18.3	19.8	108	80-120	
Cadmium	mg/kg	18.3	18.2	99	80-120	
Calcium	mg/kg	229	240	105	80-120	
Chromium	mg/kg	18.3	18.6	101	80-120	
Cobalt	mg/kg	18.3	18.2	99	80-120	
Copper	mg/kg	18.3	18.3	100	80-120	
Iron	mg/kg	229	234	102	80-120	
Lead	mg/kg	18.3	18.8	102	80-120	
Magnesium	mg/kg	229	231	101	80-120	
Manganese	mg/kg	18.3	18.7	102	80-120	

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### QUALITY CONTROL DATA

Project: Sierra Zinc- REV

Pace Project No.: 10289747

LABORATORY CONTROL SAMPLE: 1854719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	mg/kg	18.3	18.8	102	80-120	
Potassium	mg/kg	229	267	117	80-120	
Selenium	mg/kg	18.3	18.5	101	80-120	
Silver	mg/kg	18.3	18.4	100	80-120	
Sodium	mg/kg	229	232	101	80-120	
Thallium	mg/kg	18.3	18.7	102	80-120	
Vanadium	mg/kg	18.3	18.3	100	80-120	
Zinc	mg/kg	18.3	18.9	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1854720 1854721

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10290001001 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum	mg/kg	18000	20	20	17200	14300	-3780	-18200	75-125	18	20	M6	
Antimony	mg/kg	ND	20	20	13.1	13.9	65	69	75-125	6	20	M6	
Arsenic	mg/kg	1.9	20	20	24.6	24.3	113	112	75-125	1	20		
Barium	mg/kg	128	20	20	140	139	58	55	75-125	0	20	M6	
Beryllium	mg/kg	0.84	20	20	23.0	23.3	111	112	75-125	1	20		
Cadmium	mg/kg	0.16	20	20	23.2	23.0	115	114	75-125	1	20		
Calcium	mg/kg	8430	250	250	8160	6810	-110	-651	75-125	18	20	M6	
Chromium	mg/kg	19.8	20	20	43.5	40.7	118	105	75-125	7	20		
Cobalt	mg/kg	10.2	20	20	32.5	31.0	112	104	75-125	5	20		
Copper	mg/kg	23.2	20	20	44.9	41.3	109	90	75-125	8	20		
Iron	mg/kg	23900	250	250	23400	20500	-208	-1340	75-125	13	20	M6	
Lead	mg/kg	6.2	20	20	28.9	28.3	114	111	75-125	2	20		
Magnesium	mg/kg	7310	250	250	7410	6500	40	-326	75-125	13	20	M6	
Manganese	mg/kg	387	20	20	385	330	-9	-286	75-125	15	20	M6	
Nickel	mg/kg	14.4	20	20	36.8	35.4	112	105	75-125	4	20		
Potassium	mg/kg	3940	250	250	4470	4210	212	110	75-125	6	20	M6	
Selenium	mg/kg	0.77	20	20	23.5	22.8	113	110	75-125	3	20		
Silver	mg/kg	ND	20	20	22.9	22.5	114	112	75-125	1	20		
Sodium	mg/kg	282	250	250	576	599	117	127	75-125	4	20	M6	
Thallium	mg/kg	0.15	20	20	22.9	22.7	114	113	75-125	1	20		
Vanadium	mg/kg	50.0	20	20	72.9	66.7	114	83	75-125	9	20		
Zinc	mg/kg	67.3	20	20	89.7	81.8	112	72	75-125	9	20	M6	

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### QUALITY CONTROL DATA

Project: Sierra Zinc- REV

Pace Project No.: 10289747

QC Batch: MPRP/51063

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10289747001

SAMPLE DUPLICATE: 1859231

Parameter	Units	10289610002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	2.9	3.0	4	30	

SAMPLE DUPLICATE: 1859232

Parameter	Units	10289762003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	10.3	12.2	16	30	

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## QUALIFIERS

Project: Sierra Zinc- REV

Pace Project No.: 10289747

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Sierra Zinc- REV  
Pace Project No.: 10289747

<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
10289747001	SZ-SO-Assay 4-11182014	EPA 3050	MPRP/50895	EPA 6020	ICPM/22633
10289747001	SZ-SO-Assay 4-11182014	EPA 7471	MERP/12227	EPA 7471	MERC/14150
10289747001	SZ-SO-Assay 4-11182014	ASTM D2974	MPRP/51063		

**REPORT OF LABORATORY ANALYSIS**

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Table 1  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals - Solids (Soil, Rock, Sediments and Tailings)</b>								
		mg/kg	mg/kg					
Al	EPA 6020	2.00	4.00	Glass or Polyethylene	Jar 1	6°C	None	180
Sb	EPA 6020	0.104	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
As	EPA 6020	0.188	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ba	EPA 6020	0.088	0.30	Glass or Polyethylene	Jar 1	6°C	None	180
Be	EPA 6020	0.058	0.20	Glass or Polyethylene	Jar 1	6°C	None	180
Cd	EPA 6020	0.024	0.08	Glass or Polyethylene	Jar 1	6°C	None	180
Ca	EPA 6020	10.00	20.00	Glass or Polyethylene	Jar 1	6°C	None	180
Cr	EPA 6020	0.173	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Co	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Cu	EPA 6020	0.250	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Fe	EPA 6020	10.67	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Pb	EPA 6020	0.030	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
Mg	EPA 6020	2.50	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Mn	EPA 6020	0.108	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ni	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
K	EPA 6020	9.86	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Se	EPA 6020	0.198	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ag	EPA 6020	0.207	0.5	Glass or Polyethylene	Jar 1	6°C	None	180
Na	EPA 6020	20.74	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Th	EPA 6020	0.036	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
V	EPA 6020	0.050	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Zn	EPA 6020	1.15	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Hg	EPA 7471	0.006	0.02	Glass or Polyethylene	Jar 1	6°C	None	180

N/A - Not Applicable TBD - To be determined

Action limits TBD

<sup>1</sup> - Parameters to be collected at each location may vary, detection limits and methods may vary by location and anticipated concentrations.

<sup>2</sup> - All units in ug/L except as noted.

<sup>3</sup> - See bottle list for sample volumes at each sample station. Actual bottle list will be dependent on parameter list for each event and lab requirements.

<sup>4</sup> - Laboratory will measure the temperature of each cooler upon receipt to ensure proper temperature was maintained (4°C +/- 2°C)

<sup>5</sup> - Filtering and preservation may conducted by Laboratory, field filtered samples will be preserved with HNO<sub>3</sub> (pH<2)

Bottle 1 - TBD volume bottle unfiltered and preserved with HNO<sub>3</sub> for Total Metals.

Bottle 2 - TBD volume bottle . Preserved with HNO<sub>3</sub> after field filtering for Dissolved Metals or unfiltered and unpreserved for laboratory filtered Dissolved Metals .

Jar 1 - To be supplied by laboratory.



Sample Condition  
Upon Receipt

Client Name:

Project #:

**WO# : 10289747**

*Rmc*



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other: \_\_\_\_\_

Tracking Number: 8313 1122 7899

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      **Optional:** Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No

Thermom. Used:  B88A9130516413  B88A912167504  B88A9132521491      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 16.9      Cooler Temp Corrected (°C): 17.2      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: 1.013      Date and Initials of Person Examining Contents: 1/21/14 BD

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	11.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	12. <i>Date 1/18 on sample</i>
-Includes Date/Time/ID/Analysis Matrix: <i>SL</i>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____			

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

*Temp ok for metals.*

Project Manager Review: *Karl Xiong*

Date: *NW 25, 2014*

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



December 11, 2014

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

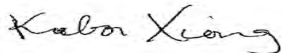
RE: Project: Sierra Zinc  
Pace Project No.: 10290040

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on November 26, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Sierra Zinc

Pace Project No.: 10290040

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: Sierra Zinc  
Pace Project No.: 10290040

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10290040001	SZ-SO-ASSAY-BF-11202014	Solid	11/20/14 00:00	11/26/14 11:10

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### SAMPLE ANALYTE COUNT

Project: Sierra Zinc

Pace Project No.: 10290040

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10290040001	SZ-SO-ASSAY-BF-11202014	EPA 6020A	RJS	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	AMP	1	PASI-M

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## ANALYTICAL RESULTS

Project: Sierra Zinc  
Pace Project No.: 10290040

**Sample:** SZ-SO-ASSAY-BF-11202014    **Lab ID:** 10290040001    Collected: 11/20/14 00:00    Received: 11/26/14 11:10    Matrix: Solid

**Results reported on a "dry-weight" basis**

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Aluminum	<b>7250</b>	mg/kg	8.8	20	12/06/14 12:37	12/11/14 10:28	7429-90-5	
Antimony	ND	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7440-36-0	
Arsenic	<b>3.7</b>	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7440-38-2	
Barium	<b>88.5</b>	mg/kg	0.26	20	12/06/14 12:37	12/11/14 10:28	7440-39-3	
Beryllium	<b>0.32</b>	mg/kg	0.18	20	12/06/14 12:37	12/11/14 10:28	7440-41-7	
Cadmium	<b>0.40</b>	mg/kg	0.070	20	12/06/14 12:37	12/11/14 10:28	7440-43-9	
Calcium	<b>36900</b>	mg/kg	350	200	12/06/14 12:37	12/11/14 11:18	7440-70-2	
Chromium	<b>9.2</b>	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7440-47-3	
Cobalt	<b>4.7</b>	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7440-48-4	
Copper	<b>15.4</b>	mg/kg	0.88	20	12/06/14 12:37	12/11/14 10:28	7440-50-8	
Iron	<b>12900</b>	mg/kg	43.8	20	12/06/14 12:37	12/11/14 10:28	7439-89-6	
Lead	<b>12.8</b>	mg/kg	0.088	20	12/06/14 12:37	12/11/14 10:28	7439-92-1	
Magnesium	<b>15000</b>	mg/kg	8.8	20	12/06/14 12:37	12/11/14 10:28	7439-95-4	
Manganese	<b>250</b>	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7439-96-5	
Nickel	<b>10.7</b>	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7440-02-0	
Potassium	<b>969</b>	mg/kg	43.8	20	12/06/14 12:37	12/11/14 00:23	7440-09-7	
Selenium	<b>0.72</b>	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7782-49-2	
Silver	ND	mg/kg	0.44	20	12/06/14 12:37	12/11/14 10:28	7440-22-4	
Sodium	<b>150</b>	mg/kg	43.8	20	12/06/14 12:37	12/11/14 10:28	7440-23-5	
Thallium	<b>0.18</b>	mg/kg	0.088	20	12/06/14 12:37	12/11/14 10:28	7440-28-0	
Vanadium	<b>27.4</b>	mg/kg	0.88	20	12/06/14 12:37	12/11/14 10:28	7440-62-2	
Zinc	<b>56.5</b>	mg/kg	4.4	20	12/06/14 12:37	12/11/14 10:28	7440-66-6	
<b>7471B Mercury</b>		Analytical Method: EPA 7471B    Preparation Method: EPA 7471B						
Mercury	ND	mg/kg	0.020	1	12/03/14 20:27	12/04/14 11:35	7439-97-6	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>6.4</b>	%	0.10	1		12/08/14 17:06		

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10290040

QC Batch: MERP/12262      Analysis Method: EPA 7471B  
QC Batch Method: EPA 7471B      Analysis Description: 7471B Mercury Solids  
Associated Lab Samples: 10290040001

METHOD BLANK: 1855879      Matrix: Solid  
Associated Lab Samples: 10290040001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	12/04/14 10:44	

LABORATORY CONTROL SAMPLE: 1855880

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.48	0.48	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1855881      1855882

Parameter	Units	10290129001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	.46	.48	0.47	0.49	100	99	75-125	5	20	

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### QUALITY CONTROL DATA

Project: Sierra Zinc

Pace Project No.: 10290040

QC Batch: MPRP/51007

Analysis Method: EPA 6020A

QC Batch Method: EPA 3050

Analysis Description: 6020A Solids UPD4

Associated Lab Samples: 10290040001

METHOD BLANK: 1857447

Matrix: Solid

Associated Lab Samples: 10290040001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.9	12/11/14 10:18	
Antimony	mg/kg	ND	0.50	12/11/14 10:18	
Arsenic	mg/kg	ND	0.50	12/11/14 10:18	
Barium	mg/kg	ND	0.30	12/11/14 10:18	
Beryllium	mg/kg	ND	0.20	12/11/14 10:18	
Cadmium	mg/kg	ND	0.079	12/11/14 10:18	
Calcium	mg/kg	ND	39.6	12/11/14 10:18	
Chromium	mg/kg	ND	0.50	12/11/14 10:18	
Cobalt	mg/kg	ND	0.50	12/11/14 10:18	
Copper	mg/kg	ND	0.99	12/11/14 10:18	
Iron	mg/kg	ND	49.5	12/11/14 10:18	
Lead	mg/kg	ND	0.099	12/11/14 10:18	
Magnesium	mg/kg	ND	9.9	12/11/14 10:18	
Manganese	mg/kg	ND	0.50	12/11/14 10:18	
Nickel	mg/kg	ND	0.50	12/11/14 10:18	
Potassium	mg/kg	ND	49.5	12/11/14 00:13	
Selenium	mg/kg	ND	0.50	12/11/14 10:18	
Silver	mg/kg	ND	0.50	12/11/14 10:18	
Sodium	mg/kg	ND	49.5	12/11/14 10:18	
Thallium	mg/kg	ND	0.099	12/11/14 10:18	
Vanadium	mg/kg	ND	0.99	12/11/14 10:18	
Zinc	mg/kg	ND	5.0	12/11/14 10:18	

LABORATORY CONTROL SAMPLE: 1857448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	19.4	21.5	111	80-120	
Antimony	mg/kg	19.4	20.4	105	80-120	
Arsenic	mg/kg	19.4	20.4	105	80-120	
Barium	mg/kg	19.4	20.4	105	80-120	
Beryllium	mg/kg	19.4	19.5	100	80-120	
Cadmium	mg/kg	19.4	20.7	106	80-120	
Calcium	mg/kg	243	263	109	80-120	
Chromium	mg/kg	19.4	21.6	111	80-120	
Cobalt	mg/kg	19.4	21.3	110	80-120	
Copper	mg/kg	19.4	22.1	114	80-120	
Iron	mg/kg	243	262	108	80-120	
Lead	mg/kg	19.4	21.4	110	80-120	
Magnesium	mg/kg	243	265	109	80-120	
Manganese	mg/kg	19.4	21.3	110	80-120	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10290040

LABORATORY CONTROL SAMPLE: 1857448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	mg/kg	19.4	21.7	112	80-120	
Potassium	mg/kg	243	289	119	80-120	
Selenium	mg/kg	19.4	20.3	104	80-120	
Silver	mg/kg	19.4	21.8	112	80-120	
Sodium	mg/kg	243	249	103	80-120	
Thallium	mg/kg	19.4	21.3	110	80-120	
Vanadium	mg/kg	19.4	20.8	107	80-120	
Zinc	mg/kg	19.4	21.7	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1857449 1857450

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10290040001 Result	Spike Conc.	Spike Conc.	MS Result							
Aluminum	mg/kg	7250	17	16	8860	10200	9480	18100	75-125	14	20	M6
Antimony	mg/kg	ND	17	16	15.3	14.2	89	87	75-125	8	20	
Arsenic	mg/kg	3.7	17	16	23.2	23.4	115	123	75-125	1	20	
Barium	mg/kg	88.5	17	16	198	148	647	368	75-125	29	20	M6,R1
Beryllium	mg/kg	0.32	17	16	20.0	19.2	116	118	75-125	4	20	
Cadmium	mg/kg	0.40	17	16	20.3	19.7	118	120	75-125	3	20	
Calcium	mg/kg	36900	211	201	25600	29200	-5360	-3840	75-125	13	20	M6
Chromium	mg/kg	9.2	17	16	33.3	33.0	142	148	75-125	1	20	M6
Cobalt	mg/kg	4.7	17	16	25.5	25.5	122	129	75-125	0	20	M6
Copper	mg/kg	15.4	17	16	35.4	37.5	118	138	75-125	6	20	M6
Iron	mg/kg	12900	211	201	14300	15200	633	1150	75-125	7	20	M6
Lead	mg/kg	12.8	17	16	34.2	33.4	126	128	75-125	2	20	M6
Magnesium	mg/kg	15000	211	201	10300	10100	-2240	-2420	75-125	1	20	M6
Manganese	mg/kg	250	17	16	279	332	171	510	75-125	17	20	M6
Nickel	mg/kg	10.7	17	16	33.0	35.4	132	154	75-125	7	20	M6
Potassium	mg/kg	969	211	201	1510	1390	257	209	75-125	9	20	M6
Selenium	mg/kg	0.72	17	16	21.0	20.0	120	120	75-125	5	20	
Silver	mg/kg	ND	17	16	20.8	20.1	122	124	75-125	4	20	
Sodium	mg/kg	150	211	201	450	461	142	155	75-125	2	20	M6
Thallium	mg/kg	0.18	17	16	20.2	19.8	118	122	75-125	2	20	
Vanadium	mg/kg	27.4	17	16	57.2	52.2	176	155	75-125	9	20	M6
Zinc	mg/kg	56.5	17	16	85.5	95.1	171	240	75-125	11	20	M6

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### QUALITY CONTROL DATA

Project: Sierra Zinc

Pace Project No.: 10290040

QC Batch: MPRP/51087

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10290040001

SAMPLE DUPLICATE: 1859890

Parameter	Units	10289933012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	15.3	15.1	1	30	

SAMPLE DUPLICATE: 1859891

Parameter	Units	10290128006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.8	14.6	6	30	

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## QUALIFIERS

Project: Sierra Zinc  
Pace Project No.: 10290040

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Sierra Zinc

Pace Project No.: 10290040

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10290040001	SZ-SO-ASSAY-BF-11202014	EPA 3050	MPRP/51007	EPA 6020A	ICPM/22696
10290040001	SZ-SO-ASSAY-BF-11202014	EPA 7471B	MERP/12262	EPA 7471B	MERC/14196
10290040001	SZ-SO-ASSAY-BF-11202014	ASTM D2974	MPRP/51087		

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Table 1  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals - Solids (Soil, Rock, Sediments and Tallings)</b>								
		mg/kg	mg/kg					
Al	EPA 6020	2.00	4.00	Glass or Polyethylene	Jar 1	6°C	None	180
Sb	EPA 6020	0.104	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
As	EPA 6020	0.188	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ba	EPA 6020	0.088	0.30	Glass or Polyethylene	Jar 1	6°C	None	180
Be	EPA 6020	0.058	0.20	Glass or Polyethylene	Jar 1	6°C	None	180
Cd	EPA 6020	0.024	0.08	Glass or Polyethylene	Jar 1	6°C	None	180
Ca	EPA 6020	10.00	20.00	Glass or Polyethylene	Jar 1	6°C	None	180
Cr	EPA 6020	0.173	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Co	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Cu	EPA 6020	0.250	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Fe	EPA 6020	10.67	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Pb	EPA 6020	0.030	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
Mg	EPA 6020	2.50	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Mn	EPA 6020	0.108	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ni	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
K	EPA 6020	9.86	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Se	EPA 6020	0.198	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ag	EPA 6020	0.207	0.5	Glass or Polyethylene	Jar 1	6°C	None	180
Na	EPA 6020	20.74	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Th	EPA 6020	0.036	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
V	EPA 6020	0.050	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Zn	EPA 6020	1.15	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Hg	EPA 7471	0.006	0.02	Glass or Polyethylene	Jar 1	6°C	None	180

N/A - Not Applicable TBD - To be determined

Action limits TBD

<sup>1</sup> - Parameters to be collected at each location may vary, detection limits and methods may vary by location and anticipated concentrations.

<sup>2</sup> - All units in ug/L except as noted.

<sup>3</sup> - See bottle list for sample volumes at each sample station. Actual bottle list will be dependent on parameter list for each event and lab requirements.

<sup>4</sup> - Laboratory will measure the temperature of each cooler upon receipt to ensure proper temperature was maintained (4°C +/- 2°C)

<sup>5</sup> - Filtering and preservation may be conducted by Laboratory, field filtered samples will be preserved with HNO<sub>3</sub> (pH<2)

Bottle 1 - TBD volume bottle unfiltered and preserved with HNO<sub>3</sub> for Total Metals.

Bottle 2 - TBD volume bottle . Preserved with HNO<sub>3</sub> after field filtering for Dissolved Metals or unfiltered and unpreserved for laboratory filtered Dissolved Metals .

Jar 1 - To be supplied by laboratory.



Sample Condition Upon Receipt

Client Name: RMC

Project #: WO# : 10290040



Courier:  Fed Ex  UPS  USPS  Client

Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 8692 64245344

Custody Seal on Cooler/Box Present?  Yes  No      Seals intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No

Thermom. Used:  B88A9130516413  B88A912167504  B88A9132521491      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 10.1      Cooler Temp Corrected (°C): 10.5      Biological Tissue Frozen?  Yes  No  N/A  
Temp should be above freezing to 6°C      Correction Factor: 10.1      Date and Initials of Person Examining Contents: EM/11/26/14

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	11.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	12. <u>No Time or cont. or Col</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>			
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____			

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: Temp ok for metals.

Project Manager Review: Karl Xiang

Date: Dec. 1, 2014

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





## ANALYTICAL REPORT

Report Date: January 07, 2015

Lyndsey Fox  
Resource Environmental Managment Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1435008**

Project ID: Sierra Zinc

Purchase Order: Sierra Zinc

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
Barrel#2	1435008001	10/30/14	12/15/14	Sierra Zinc





# ANALYTICAL REPORT

Workorder: **34-1435008**

Client: Resource Environmental Management Consultant, Inc.

Project Manager: Kevin W. Griffiths

## Analytical Results

Sample ID: <b>Barrel#2</b>	Sampling Site: Sierra Zinc	Collected: 10/30/2014
Lab ID: 1435008001	Media: Bulk	Received: 12/15/2014
Matrix: Soil/Solid/Sediment	Sampling Parameter: NA	

### Analysis Method - EPA 7.3.3.2

Preparation: Not Applicable	Analysis: EPA 7.3.3.2, Soil Batch: EWC/5462 (HBN: 140620) Analyzed: 12/23/2014 11:15	Instrument ID: WET01 Percent Solid: NA Report Basis: Wet
-----------------------------	--	--

Analyte	ug/g	RL (ug/g)	Dilution	Qual.
Reactive Cyanide	ND	0.25	1	

### Analysis Method - EPA 7.3.4.2

Preparation: Not Applicable	Analysis: EPA 7.3.4.2, Soil Batch: EWC/5463 (HBN: 140621) Analyzed: 12/22/2014 08:15	Instrument ID: WET06 Percent Solid: NA Report Basis: Wet
-----------------------------	--	--

Analyte	ug/g	RL (ug/g)	Dilution	Qual.
Reactive Sulfide	ND	50	1	

### Analysis Method - Physical Property

Preparation: Not Applicable	Analysis: Physical Property, Oxidizer Batch: EWC/5472 (HBN: 140803) Analyzed: 12/16/2014 15:00	Instrument ID: NONE Percent Solid: NA Report Basis: Wet
-----------------------------	--	---

Analyte	Result	RL ( )	Dilution	Qual.
Oxidizer (Potassium Iodide)	Non-Oxidizer	NA	1	

### Analysis Method - Physical Property

Preparation: Not Applicable	Analysis: Physical Property, Water Misc Batch: EWC/5474 (HBN: 140924) Analyzed: 12/17/2014 12:00	Instrument ID: NONE Percent Solid: NA Report Basis: Wet
-----------------------------	--	---

Analyte	g/mL	MDL (g/mL)	RL (g/mL)	Dilution	Qual.
Water Miscibility	Immiscible	NA	NA	1	U

### Analysis Method - SW 1030

Preparation: Not Applicable	Analysis: SW 1030, Ignitability Soil Batch: EWC/5458 (HBN: 140582) Analyzed: 12/16/2014 14:45	Instrument ID: NONE Percent Solid: NA Report Basis: Wet
-----------------------------	---	---

Analyte	mm/sec	RL (mm/sec)	Dilution	Qual.
Ignitability (Flashpoint)	<2.2	2.2	1	

### Analysis Method - SW 6010C

Preparation: EPA 3015 SPLP/TCLP, Prep Batch: EIPX/5239 (HBN: 140717) Prepared: 12/18/2014	Weight/Volume Initial: 50 mL Final: 50 mL	Analysis: SW 6010C SPLP/TCLP, Water Batch: EICP/4837 (HBN: 140821) Analyzed: 12/19/2014 12:03	Instrument ID: ICP08 Percent Solid: NA Report Basis: Wet
---	---	---	--

Analyte	mg/L	Reg. Limit (mg/L)	RL (mg/L)	Dilution	Qual.
Arsenic	ND	5.0	0.27	1	
Barium	1.36	100	0.018	1	
Cadmium	ND	1.0	0.0090	1	
Chromium	ND	5.0	0.018	1	
Lead	ND	5.0	0.090	1	
Selenium	ND	1.0	0.27	1	
Silver	ND	5.0	0.018	1	

Results Continued on Next Page





# ANALYTICAL REPORT

Workorder: **34-1435008**

Client: Resource Environmental Management Consultant, Inc.

Project Manager: Kevin W. Griffiths

## Analytical Results

Sample ID: <b>Barrel#2</b>	Sampling Site: Sierra Zinc	Collected: 10/30/2014
Lab ID: 1435008001	Media: Bulk	Received: 12/15/2014
Matrix: Soil/Solid/Sediment	Sampling Parameter: NA	

### Analysis Method - SW 7470

<b>Preparation:</b> SW 7470A SPLP/TCLP, Water Prep	<u>Weight/Volume</u>	<b>Analysis:</b> SW 7470A SPLP/TCLP, Water	<b>Instrument ID:</b> AACV02
<b>Batch:</b> EHG/5656 (HBN: 140676)	<b>Initial:</b> 25 mL	<b>Batch:</b> EHG/5659 (HBN: 140848)	<b>Percent Solid:</b> NA
<b>Prepared:</b> 12/18/2014	<b>Final:</b> 50 mL	<b>Analyzed:</b> 12/19/2014 12:34	<b>Report Basis:</b> Wet

Analyte	mg/L	Reg. Limit (mg/L)	RL (mg/L)	Dilution	Qual.
Mercury	ND	0.20	0.00020	1	

### Analysis Method - SW 8081

<b>Preparation:</b> EPA 3510, Sep Funnel Pest/ARO TCLP	<u>Weight/Volume</u>	<b>Analysis:</b> SW 8081 SPLP/TCLP, Water	<b>Instrument ID:</b> GCE18
<b>Batch:</b> ENVX/20641 (HBN: 140659)	<b>Initial:</b> 100 mL	<b>Batch:</b> EGC/5468 (HBN: 140949)	<b>Percent Solid:</b> NA
<b>Prepared:</b> 12/17/2014	<b>Final:</b> 10 mL	<b>Analyzed:</b> 12/23/2014 00:00	<b>Report Basis:</b> Wet

Analyte	mg/L	RL (mg/L)	Dilution	Qual.
gamma-BHC	ND	0.00020	1	
Heptachlor	ND	0.00020	1	
Heptachlor epoxide	ND	0.00020	1	
gamma-Chlordane	ND	0.00020	1	
alpha-Chlordane	ND	0.00020	1	
Endrin	ND	0.00020	1	
Methoxychlor	ND	0.00020	1	
Toxaphene	ND	0.10	1	

### Analysis Method - SW 8082

<b>Preparation:</b> EPA 3550, Sonic Ext, ARO Soil	<u>Weight/Volume</u>	<b>Analysis:</b> SW 8082, Soil	<b>Instrument ID:</b> GCE03
<b>Batch:</b> ENVX/20619 (HBN: 140571)	<b>Initial:</b> 3 grams	<b>Batch:</b> EGC/5465 (HBN: 140860)	<b>Percent Solid:</b> NA
<b>Prepared:</b> 12/16/2014	<b>Final:</b> 10 mL	<b>Analyzed:</b> 12/16/2014 00:00	<b>Report Basis:</b> Wet

Analyte	ug/g	MDL (ug/g)	RL (ug/g)	Dilution	Qual.
Aroclor 1221	ND	0.033	0.067	1	U
Aroclor 1232	ND	0.013	0.033	1	U
Aroclor 1016	ND	0.011	0.033	1	U
Aroclor 1242	ND	0.0099	0.033	1	U
Aroclor 1248	ND	0.011	0.033	1	U
Aroclor 1254	ND	0.011	0.033	1	U
Aroclor 1260	ND	0.011	0.033	1	U
Aroclor 1262	ND	0.015	0.033	1	U
Aroclor 1268	ND	0.012	0.033	1	U

### Analysis Method - SW 8260 SPLP/TCLP

<b>Preparation:</b> EPA 1311 TCLP, Volatiles	<u>Weight/Volume</u>	<b>Analysis:</b> SW 8260 SPLP/TCLP, Water	<b>Instrument ID:</b> 5975-J
<b>Batch:</b> ENVX/20618 (HBN: 140563)	<b>Initial:</b> grams	<b>Batch:</b> EVO/5434 (HBN: 140701)	<b>Percent Solid:</b> NA
<b>Prepared:</b> 12/17/2014	<b>Final:</b> mL	<b>Analyzed:</b> 12/17/2014 23:46	<b>Report Basis:</b> Wet

Analyte	mg/L	Reg. Limit (mg/L)	RL (mg/L)	Dilution	Qual.
Vinyl chloride	ND	0.20	0.0050	1	
1,1-Dichloroethene	ND	0.70	0.0050	1	
Methyl ethyl ketone	0.014	200	0.0050	1	

Results Continued on Next Page





# ANALYTICAL REPORT

Workorder: **34-1435008**

Client: Resource Environmental  
Management Consultant, Inc.

Project Manager: Kevin W. Griffiths

## Analytical Results

Sample ID: <b>Barrel#2</b>	Sampling Site: Sierra Zinc	Collected: 10/30/2014
Lab ID: 1435008001	Media: Bulk	Received: 12/15/2014
Matrix: Soil/Solid/Sediment	Sampling Parameter: NA	

### Analysis Method - SW 8260 SPLP/TCLP

Preparation: EPA 1311 TCLP, Volatiles	<u>Weight/Volume</u>	Analysis: SW 8260 SPLP/TCLP, Water	Instrument ID: 5975-J
Batch: ENVX/20618 (HBN: 140563)	Initial: grams	Batch: EVO/5434 (HBN: 140701)	Percent Solid: NA
Prepared: 12/17/2014	Final: mL	Analyzed: 12/17/2014 23:46	Report Basis: Wet

Analyte	mg/L	Reg. Limit (mg/L)	RL (mg/L)	Dilution	Qual.
Chloroform	ND	6.0	0.0050	1	
1,2-Dichloroethane	ND	0.50	0.0050	1	
Carbon tetrachloride	ND	0.50	0.0050	1	
Benzene	ND	0.50	0.0050	1	
Trichloroethene	ND	0.50	0.0050	1	
Tetrachloroethene	ND	0.70	0.0050	1	
Chlorobenzene	ND	100	0.0050	1	

### Analysis Method - SW 8270

Preparation: EPA 3510, Sep Funnel SVOA TCLP	<u>Weight/Volume</u>	Analysis: SW 8270 SPLP/TCLP, Water	Instrument ID: 5975-H
Batch: ENVX/20642 (HBN: 140668)	Initial: 100 mL	Batch: ESVO/4804 (HBN: 141061)	Percent Solid: NA
Prepared: 12/17/2014	Final: 1 mL	Analyzed: 12/22/2014 22:28	Report Basis: Wet

Analyte	mg/L	Reg. Limit (mg/L)	RL (mg/L)	Dilution	Qual.
Pyridine	ND	5.0	0.050	1	
1,4-Dichlorobenzene	ND	7.5	0.050	1	
o-Cresol	ND	200	0.050	1	
Hexachloroethane	ND	3.0	0.050	1	
Nitrobenzene	ND	2.0	0.050	1	
Hexachloro-1,3-butadiene	ND	0.50	0.050	1	
2,4,6-Trichlorophenol	ND	2.0	0.050	1	
2,4,5-Trichlorophenol	ND	400	0.050	1	
2,4-Dinitrotoluene	ND	0.13	0.050	1	
Hexachlorobenzene	ND	0.13	0.050	1	
Pentachlorophenol	ND	100	0.20	1	
m&p-Cresol	ND	200	0.050	1	

### Analysis Method - SW 9045

Preparation: Not Applicable	Analysis: SW 9045C, pH, Soil	Instrument ID: WET10
	Batch: EWC/5459 (HBN: 140583)	Percent Solid: NA
	Analyzed: 12/17/2014 12:00	Report Basis: Wet

Analyte	pH	RL (pH)	Dilution	Qual.
pH	11.39	NA	1	

## Comments

Workorder: 1435008

For Method 8151, an extraction error occurred during sample prep. No additional volume remained to perform a re-extract. NC/CAR-0930 was initiated.





# ANALYTICAL REPORT

Workorder: **34-1435008**

Client: Resource Environmental  
Management Consultant, Inc.

Project Manager: Kevin W. Griffiths

## Comments

### Quality Control: SW 7470 - (HBN: 140848)

TCLP extracts for mercury analysis were diluted 2-fold prior to sample digestion by taking 25mL initial sample volume to 50mL final volume with ASTM Type II water. This was done in order to reduce potential matrix effects. The reporting limit was also raised by the dilution factor.

### Quality Control: SW 8270 - (HBN: 141061)

In the LCS/LCSD, pyridine was high for RPD.

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 7.3.3.2	/S/ Brittney Austin 12/23/2014 14:12	/S/ Whitney Lewis 12/23/2014 14:12
EPA 7.3.4.2	/S/ Brittney Austin 12/23/2014 06:12	/S/ Whitney Lewis 12/23/2014 11:12
Physical Property	/S/ Whitney Lewis 12/22/2014 15:12	/S/ Brittney Austin 12/23/2014 06:12
SW 1030	/S/ Whitney Lewis 12/17/2014 13:12	/S/ Brittney Austin 12/17/2014 13:12
SW 6010C	/S/ Neil A. Edwards 12/19/2014 12:12	/S/ Kristie F. Bitner 12/19/2014 13:12
SW 7470	/S/ Christopher R. Hansen 12/19/2014 13:12	/S/ Kristie F. Bitner 12/19/2014 16:12
SW 8081	/S/ Mila V. Potekhin 12/23/2014 12:12	/S/ Nadjla Borges 12/23/2014 15:12
SW 8082	/S/ Mila V. Potekhin 12/19/2014 15:12	/S/ Nadjla Borges 12/19/2014 16:12
SW 8260 SPLP/TCLP	/S/ Christopher Q. Coleman 12/18/2014 22:12	/S/ Thomas J. Masoian 12/19/2014 07:12
SW 8270	/S/ Dustin Calder 12/23/2014 16:12	/S/ Jessica Helland 12/23/2014 17:12
SW 9045	/S/ Whitney Lewis 12/17/2014 15:12	/S/ Brittney Austin 12/19/2014 10:12

## Laboratory Contact Information

ALS Environmental  
960 W Levoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: als@alstlab.com  
Web: www.alssl.com





# ANALYTICAL REPORT

**Workorder:** 34-1435008

**Client:** Resource Environmental Management Consultant, Inc.

**Project Manager:** Kevin W. Griffiths

## General Lab Comments

The results provided in this report relate only to the items tested.  
Samples were received in acceptable condition unless otherwise noted.  
Samples have not been blank corrected unless otherwise noted.  
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.  
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.  
CRDL = Contract Required Detection Limit  
Reg. Limit = Regulatory Limit.  
ND = Not Detected, testing result not detected above the MDL or RL.  
< This testing result is less than the numerical value.  
\*\* No result could be reported, see sample comments for details.

## Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.  
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.  
B = Qualifier indicates that the analyte was detected in the blank.  
E = Qualifier indicates that the analyte result exceeds calibration range.  
P = Qualifier indicates that the RPD between the two columns is greater than 40%.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1514243

**Limits:** Historical/Performance

**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep

**Batch:** IIPX/16806 (HBN: 149271)

**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC

**Batch:** IICP/11006 (HBN: 149403)

**Analyzed By:** Peter P. Steen

## Blank

**LRB:** 448307

**Analyzed:** 05/26/2015 16:25

**Units:** ug/sample

Analyte	Result	MDL	RL
Lead	0.563	0.375	1.25

**LMB:** 448308

**Analyzed:** 05/26/2015 16:29

**Units:** ug/sample

Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

**LCS:** 448309

**Analyzed:** 05/26/2015 16:32

**Dilution:** 1

**Units:** ug/sample

**LCSD:** 448310

**Analyzed:** 05/26/2015 16:36

**Dilution:** 1

**Units:** ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Lead	102	100	102	88.0 115.0	103	103	0.681	0.0 15.0

## QC Data Approved and Reviewed by

Peter P. Steen

Penny A. Foote

5/27/2015

**Analyst**

**Peer Review**

**Date**

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

## Amended-20150529

Report Date: May 29, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1514243**

Client Project ID: Sierra Zinc-Colville, WA  
Purchase Order: Sierra Zinc-Colville  
Project Manager: Kevin Griffiths

### Analytical Results

Sample ID: <b>SZ-AR-1 5182015</b>		Collected: 05/18/2015		
Lab ID: 1514243001	Sampling Location: Sierra Zinc-Colville		Received: 05/22/2015	
Method: NIOSH 7300 Mod.		Media: PVC Filter	Prepared: 05/26/2015	
		Sampling Parameter: Air Volume 2528 L	Analyzed: 05/26/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-2 5182015</b>		Collected: 05/18/2015		
Lab ID: 1514243002	Sampling Location: Sierra Zinc-Colville		Received: 05/22/2015	
Method: NIOSH 7300 Mod.		Media: PVC Filter	Prepared: 05/26/2015	
		Sampling Parameter: Air Volume 2516 L	Analyzed: 05/26/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-1 5192015</b>		Collected: 05/19/2015		
Lab ID: 1514243003	Sampling Location: Sierra Zinc-Colville		Received: 05/22/2015	
Method: NIOSH 7300 Mod.		Media: PVC Filter	Prepared: 05/26/2015	
		Sampling Parameter: Air Volume 2560 L	Analyzed: 05/26/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-2 5192015</b>		Collected: 05/19/2015		
Lab ID: 1514243004	Sampling Location: Sierra Zinc-Colville		Received: 05/22/2015	
Method: NIOSH 7300 Mod.		Media: PVC Filter	Prepared: 05/26/2015	
		Sampling Parameter: Air Volume 2552 L	Analyzed: 05/26/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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[www.alsglobal.com](http://www.alsglobal.com)

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# ANALYTICAL REPORT

**Amended-20150529**

Workorder: **34-1514243**

Client Project ID: Sierra Zinc-Colville, WA

Purchase Order: Sierra Zinc-Colville

Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1 5202015</b>					Collected: 05/20/2015
Lab ID: 1514243005		Sampling Location: Sierra Zinc-Colville			Received: 05/22/2015
Method: NIOSH 7300 Mod.		Media: MCE Filter		Prepared: 05/26/2015	
		Sampling Parameter: Air Volume 2624 L		Analyzed: 05/26/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)	
Lead	<0.38	<0.00014	0.38	1.3	

Sample ID: <b>SZ-AR-2 5202015</b>					Collected: 05/20/2015
Lab ID: 1514243006		Sampling Location: Sierra Zinc-Colville			Received: 05/22/2015
Method: NIOSH 7300 Mod.		Media: MCE Filter		Prepared: 05/26/2015	
		Sampling Parameter: Air Volume 2616 L		Analyzed: 05/26/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)	
Lead	<0.38	<0.00014	0.38	1.3	

Sample ID: <b>SZ-AR-3 5202015</b>					Collected: 05/20/2015
Lab ID: 1514243007		Sampling Location: Sierra Zinc-Colville			Received: 05/22/2015
Method: NIOSH 7300 Mod.		Media: MCE Filter		Prepared: 05/26/2015	
		Sampling Parameter: Air Volume 2596 L		Analyzed: 05/26/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)	
Lead	<0.38	<0.00014	0.38	1.3	

## Comments

Workorder: 1514243

Samples 1514243001-004 did not fully digest and are likely PVC filter media.

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 05/27/2015 16:05	/S/ Penny A. Foote 05/27/2015 16:05

## Laboratory Contact Information

ALS Environmental  
960 W Levoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: alsit.lab@ALSGlobal.com  
Web: www.alsslc.com





# ANALYTICAL REPORT

**Amended-20150529**

Workorder: **34-1514243**

Client Project ID: Sierra Zinc-Colville, WA

Purchase Order: Sierra Zinc-Colville

Project Manager: Kevin Griffiths

## General Lab Comments

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Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACCLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1514923

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16848 (HBN: 149598)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11022 (HBN: 149669)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 449169 <b>Analyzed:</b> 06/01/2015 11:57 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 449170 <b>Analyzed:</b> 06/01/2015 12:01 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 449171 <b>Analyzed:</b> 06/01/2015 12:05 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 449172 <b>Analyzed:</b> 06/01/2015 12:08 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	101	100	101	88.0 115.0	102	102	0.830	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Peter P. Steen</u>	<u>Brittney Austin</u>	<u>6/1/2015</u>
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

## Amended-20150602

Report Date: June 02, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1514923**

Client Project ID: Resource Environmental  
Managem

Purchase Order: NA

Project Manager: Kevin Griffiths

### Analytical Results

Sample ID: <b>SZ-AR-1-5272015</b>		Collected: 05/27/2015		
Lab ID: 1514923001		Received: 05/29/2015		
Method: NIOSH 7300 Mod.		Media: MCE Filter		Prepared: 06/01/2015
		Sampling Parameter: Air Volume 2648 L		Analyzed: 06/01/2015
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-2-5272015</b>		Collected: 05/27/2015		
Lab ID: 1514923002		Received: 05/29/2015		
Method: NIOSH 7300 Mod.		Media: MCE Filter		Prepared: 06/01/2015
		Sampling Parameter: Air Volume 2644 L		Analyzed: 06/01/2015
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-3-5272015</b>		Collected: 05/27/2015		
Lab ID: 1514923003		Received: 05/29/2015		
Method: NIOSH 7300 Mod.		Media: MCE Filter		Prepared: 06/01/2015
		Sampling Parameter: Air Volume 2640 L		Analyzed: 06/01/2015
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

### Report Authorization ( /S/ is an electronic signature that complies with 21 CFR Part 11 )

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 06/01/2015 14:06	/S/ Brittney Austin 06/01/2015 15:06

### Laboratory Contact Information

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# ANALYTICAL REPORT

**Amended-20150602**

Workorder: **34-1514923**

Client Project ID: Resource Environmental  
Managem

Purchase Order: NA  
Project Manager: Kevin Griffiths

## General Lab Comments

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Samples were received in acceptable condition unless otherwise noted.  
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Environmental	ACLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

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NA = Not Applicable.  
\*\* No result could be reported, see sample comments for details.  
< This testing result is less than the numerical value.  
( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1515209

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16867 (HBN: 149753)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11035 (HBN: 149820)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 449650 <b>Analyzed:</b> 06/03/2015 08:48 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 449651 <b>Analyzed:</b> 06/03/2015 08:52 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	0.602	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 449652 <b>Analyzed:</b> 06/03/2015 08:55 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 449653 <b>Analyzed:</b> 06/03/2015 08:59 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	109	100	109	88.0 115.0	109	109	0.340	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Peter P. Steen</u>	<u>Neil A. Edwards</u>	<u>6/3/2015</u>
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

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RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: June 03, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1515209**

Client Project ID: Sierra Zinc 060115  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-5282015</b>		Collected: 05/28/2015		
Lab ID: 1515209001	Sampling Location: Sierra Zinc		Received: 06/01/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/02/2015	
		Sampling Parameter: Air Volume 2520 L	Analyzed: 06/03/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	(0.44)	(0.00017)	0.38	1.3

Sample ID: <b>SZ-AR-2-5282015</b>		Collected: 05/28/2015		
Lab ID: 1515209002	Sampling Location: Sierra Zinc		Received: 06/01/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/02/2015	
		Sampling Parameter: Air Volume 2520 L	Analyzed: 06/03/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 06/03/2015 13:06	/S/ Neil A. Edwards 06/03/2015 15:06

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: als@alst.com  
Web: www.alssl.com





# ANALYTICAL REPORT

Workorder: **34-1515209**

Client Project ID: Sierra Zinc 060115

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## General Lab Comments

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	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

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NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

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# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1515504

**Limits:** Historical/Performance

**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep

**Batch:** IIPX/16896 (HBN: 149955)

**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC

**Batch:** IICP/11048 (HBN: 149990)

**Analyzed By:** Peter P. Steen

## Blank

**LRB:** 450211

**Analyzed:** 06/05/2015 12:43

**Units:** ug/sample

Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

**LMB:** 450212

**Analyzed:** 06/05/2015 12:46

**Units:** ug/sample

Analyte	Result	MDL	RL
Lead	0.755	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

**LCS:** 450213

**Analyzed:** 06/05/2015 12:49

**Dilution:** 1

**Units:** ug/sample

**LCSD:** 450214

**Analyzed:** 06/05/2015 12:53

**Dilution:** 1

**Units:** ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Lead	108	100	108	88.0 115.0	109	109	0.681	0.0 15.0

## QC Data Approved and Reviewed by

Peter P. Steen

Analyst

Lauren Jones

Peer Review

6/5/2015

Date

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: June 05, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1515504**

Client Project ID: Sierra Zinc 060315  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6012015</b>		Collected: 06/01/2015		
Lab ID: 1515504001	Sampling Location: Sierra Zinc		Received: 06/03/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/05/2015	
		Sampling Parameter: Air Volume 2524 L	Analyzed: 06/05/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	(0.42)	(0.00016)	0.38	1.3

Sample ID: <b>SZ-AR-2-6012015</b>		Collected: 06/01/2015		
Lab ID: 1515504002	Sampling Location: Sierra Zinc		Received: 06/03/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/05/2015	
		Sampling Parameter: Air Volume 2764 L	Analyzed: 06/05/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 06/05/2015 14:06	/S/ Lauren Jones 06/05/2015 16:06

## Laboratory Contact Information

ALS Environmental  
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Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: als@alst.com  
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# ANALYTICAL REPORT

Workorder: **34-1515504**

Client Project ID: Sierra Zinc 060315

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## General Lab Comments

The results provided in this report relate only to the items tested.  
Samples were received in acceptable condition unless otherwise noted.  
Samples have not been blank corrected unless otherwise noted.  
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All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

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Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACCLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwlabservice.htm">http://ndep.nv.gov/bsdwlabservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1515644

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16902 (HBN: 150005)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11053 (HBN: 150123)  
**Analyzed By:** Penny A. Foote

## Blank

<b>LRB:</b> 450335 <b>Analyzed:</b> 06/08/2015 14:41  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	0.431	0.375	1.25

<b>LMB:</b> 450336 <b>Analyzed:</b> 06/08/2015 14:44  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 450337 <b>Analyzed:</b> 06/08/2015 14:48 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 450338 <b>Analyzed:</b> 06/08/2015 14:51 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	100	100	100	88.0 115.0	101	101	1.27	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Penny A. Foote</u>	<u>Lauren Jones</u>	<u>6/8/2015</u>
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: June 08, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1515644**

Client Project ID: Sierra Zinc 060515  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6032015</b>		Collected: 06/03/2015		
Lab ID: 1515644001	Sampling Location: Sierra Zinc		Received: 06/05/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/08/2015	
		Sampling Parameter: Air Volume 2800 L	Analyzed: 06/08/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00013	0.38	1.3

Sample ID: <b>SZ-AR-2-6032015</b>		Collected: 06/03/2015		
Lab ID: 1515644002	Sampling Location: Sierra Zinc		Received: 06/05/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/08/2015	
		Sampling Parameter: Air Volume 2804 L	Analyzed: 06/08/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00013	0.38	1.3

Sample ID: <b>SZ-AR-3-6032015</b>		Collected: 06/03/2015		
Lab ID: 1515644003	Sampling Location: Sierra Zinc		Received: 06/05/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/08/2015	
		Sampling Parameter: Air Volume 2820 L	Analyzed: 06/08/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00013	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Penny A. Foote 06/08/2015 15:06	/S/ Lauren Jones 06/08/2015 15:06

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: alsft.lab@ALSGlobal.com  
Web: www.alssl.com

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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# ANALYTICAL REPORT

Workorder: **34-1515644**

Client Project ID: Sierra Zinc 060515

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

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	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

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NA = Not Applicable.

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June 09, 2015

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

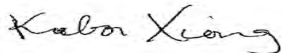
RE: Project: Sierra Zinc  
Pace Project No.: 10308090

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on May 28, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim, Resource Management Consultants



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Sierra Zinc  
Pace Project No.: 10308090

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: Sierra Zinc

Pace Project No.: 10308090

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10308090001	SZ-SW-Adit-5262015	Water	05/26/15 06:40	05/28/15 09:50
10308090002	SZ-SW-Adit-05-5262015	Water	05/26/15 06:50	05/28/15 09:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Sierra Zinc

Pace Project No.: 10308090

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10308090001	SZ-SW-Adit-5262015	EPA 200.8	RJS	22	PASI-M
		EPA 200.8	TT3	22	PASI-M
		EPA 245.1	JDD	1	PASI-M
		EPA 245.1	LMW	1	PASI-M
10308090002	SZ-SW-Adit-05-5262015	EPA 200.8	RJS	22	PASI-M
		EPA 200.8	TT3	22	PASI-M
		EPA 245.1	JDD	1	PASI-M
		EPA 245.1	LMW	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc  
Pace Project No.: 10308090

**Sample: SZ-SW-Adit-5262015**      **Lab ID: 10308090001**      Collected: 05/26/15 06:40      Received: 05/28/15 09:50      Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8								
Aluminum	ND	ug/L	10.0	1	06/03/15 07:26	06/04/15 16:07	7429-90-5	
Antimony	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7440-36-0	
Arsenic	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7440-38-2	
Barium	25.5	ug/L	0.30	1	06/03/15 07:26	06/04/15 16:07	7440-39-3	
Beryllium	ND	ug/L	0.20	1	06/03/15 07:26	06/04/15 16:07	7440-41-7	
Cadmium	2.8	ug/L	0.080	1	06/03/15 07:26	06/04/15 16:07	7440-43-9	
Calcium	63400	ug/L	400	10	06/03/15 07:26	06/05/15 16:59	7440-70-2	
Chromium	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7440-47-3	
Cobalt	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7440-48-4	
Copper	ND	ug/L	1.0	1	06/03/15 07:26	06/04/15 16:07	7440-50-8	
Iron	ND	ug/L	50.0	1	06/03/15 07:26	06/04/15 16:07	7439-89-6	
Lead	6.2	ug/L	0.10	1	06/03/15 07:26	06/04/15 16:07	7439-92-1	
Magnesium	21000	ug/L	10.0	1	06/03/15 07:26	06/04/15 16:07	7439-95-4	
Manganese	2.0	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7439-96-5	
Nickel	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7440-02-0	
Potassium	2630	ug/L	50.0	1	06/03/15 07:26	06/04/15 16:07	7440-09-7	
Selenium	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7782-49-2	
Silver	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:07	7440-22-4	
Sodium	5610	ug/L	50.0	1	06/03/15 07:26	06/04/15 16:07	7440-23-5	
Thallium	ND	ug/L	0.10	1	06/03/15 07:26	06/04/15 16:07	7440-28-0	
Vanadium	ND	ug/L	1.0	1	06/03/15 07:26	06/04/15 16:07	7440-62-2	
Zinc	305	ug/L	5.0	1	06/03/15 07:26	06/04/15 16:07	7440-66-6	

<b>200.8 MET ICPMS, Lab Filtered</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8								
Aluminum, Dissolved	ND	ug/L	10.0	1	06/04/15 08:18	06/04/15 17:04	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7440-38-2	
Barium, Dissolved	27.6	ug/L	0.30	1	06/04/15 08:18	06/04/15 17:04	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/04/15 08:18	06/04/15 17:04	7440-41-7	
Cadmium, Dissolved	2.9	ug/L	0.080	1	06/04/15 08:18	06/04/15 17:04	7440-43-9	
Calcium, Dissolved	71200	ug/L	200	5	06/04/15 08:18	06/05/15 20:03	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	06/04/15 08:18	06/04/15 17:04	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	06/04/15 08:18	06/04/15 17:04	7439-89-6	
Lead, Dissolved	5.9	ug/L	0.10	1	06/04/15 08:18	06/04/15 17:04	7439-92-1	
Magnesium, Dissolved	22400	ug/L	10.0	1	06/04/15 08:18	06/04/15 17:04	7439-95-4	
Manganese, Dissolved	1.9	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7440-02-0	
Potassium, Dissolved	2780	ug/L	50.0	1	06/04/15 08:18	06/04/15 17:04	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:04	7440-22-4	
Sodium, Dissolved	5970	ug/L	50.0	1	06/04/15 08:18	06/04/15 17:04	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	06/04/15 08:18	06/04/15 17:04	7440-28-0	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/04/15 08:18	06/04/15 17:04	7440-62-2	
Zinc, Dissolved	296	ug/L	5.0	1	06/04/15 08:18	06/04/15 17:04	7440-66-6	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc  
Pace Project No.: 10308090

Sample: SZ-SW-Adit-5262015		Lab ID: 10308090001	Collected: 05/26/15 06:40	Received: 05/28/15 09:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>245.1 Mercury</b> Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	ND	ug/L	0.20	1	06/03/15 07:05	06/03/15 20:13	7439-97-6	
<b>245.1 Mercury, Lab Filtered</b> Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.20	1	06/04/15 09:35	06/04/15 14:24	7439-97-6	

Sample: SZ-SW-Adit-05-5262015		Lab ID: 10308090002	Collected: 05/26/15 06:50	Received: 05/28/15 09:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Aluminum	ND	ug/L	10.0	1	06/03/15 07:26	06/04/15 16:43	7429-90-5	
Antimony	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7440-36-0	
Arsenic	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7440-38-2	
Barium	25.5	ug/L	0.30	1	06/03/15 07:26	06/04/15 16:43	7440-39-3	
Beryllium	ND	ug/L	0.20	1	06/03/15 07:26	06/04/15 16:43	7440-41-7	
Cadmium	2.7	ug/L	0.080	1	06/03/15 07:26	06/04/15 16:43	7440-43-9	
Calcium	66100	ug/L	200	5	06/03/15 07:26	06/05/15 11:15	7440-70-2	
Chromium	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7440-47-3	
Cobalt	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7440-48-4	
Copper	ND	ug/L	1.0	1	06/03/15 07:26	06/04/15 16:43	7440-50-8	
Iron	ND	ug/L	50.0	1	06/03/15 07:26	06/04/15 16:43	7439-89-6	
Lead	6.2	ug/L	0.10	1	06/03/15 07:26	06/04/15 16:43	7439-92-1	
Magnesium	20900	ug/L	10.0	1	06/03/15 07:26	06/04/15 16:43	7439-95-4	
Manganese	2.1	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7439-96-5	
Nickel	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7440-02-0	
Potassium	2610	ug/L	50.0	1	06/03/15 07:26	06/04/15 16:43	7440-09-7	
Selenium	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7782-49-2	
Silver	ND	ug/L	0.50	1	06/03/15 07:26	06/04/15 16:43	7440-22-4	
Sodium	5600	ug/L	50.0	1	06/03/15 07:26	06/04/15 16:43	7440-23-5	
Thallium	ND	ug/L	0.10	1	06/03/15 07:26	06/04/15 16:43	7440-28-0	
Vanadium	ND	ug/L	1.0	1	06/03/15 07:26	06/04/15 16:43	7440-62-2	
Zinc	308	ug/L	5.0	1	06/03/15 07:26	06/04/15 16:43	7440-66-6	

Sample: SZ-SW-Adit-05-5262015		Lab ID: 10308090002	Collected: 05/26/15 06:50	Received: 05/28/15 09:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS, Lab Filtered</b> Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Aluminum, Dissolved	ND	ug/L	10.0	1	06/04/15 08:18	06/04/15 17:07	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7440-38-2	
Barium, Dissolved	27.0	ug/L	0.30	1	06/04/15 08:18	06/04/15 17:07	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	06/04/15 08:18	06/04/15 17:07	7440-41-7	
Cadmium, Dissolved	2.7	ug/L	0.080	1	06/04/15 08:18	06/04/15 17:07	7440-43-9	
Calcium, Dissolved	69700	ug/L	200	5	06/04/15 08:18	06/05/15 20:06	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	06/04/15 08:18	06/04/15 17:07	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	06/04/15 08:18	06/04/15 17:07	7439-89-6	

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## ANALYTICAL RESULTS

Project: Sierra Zinc  
Pace Project No.: 10308090

Sample: <b>SZ-SW-Adit-05-5262015</b>	Lab ID: <b>10308090002</b>	Collected: 05/26/15 06:50	Received: 05/28/15 09:50	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS, Lab Filtered</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Lead, Dissolved	<b>5.8</b>	ug/L	0.10	1	06/04/15 08:18	06/04/15 17:07	7439-92-1	
Magnesium, Dissolved	<b>22100</b>	ug/L	10.0	1	06/04/15 08:18	06/04/15 17:07	7439-95-4	
Manganese, Dissolved	<b>1.9</b>	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7440-02-0	
Potassium, Dissolved	<b>2720</b>	ug/L	50.0	1	06/04/15 08:18	06/04/15 17:07	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	06/04/15 08:18	06/04/15 17:07	7440-22-4	
Sodium, Dissolved	<b>5900</b>	ug/L	50.0	1	06/04/15 08:18	06/04/15 17:07	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	06/04/15 08:18	06/04/15 17:07	7440-28-0	
Vanadium, Dissolved	ND	ug/L	1.0	1	06/04/15 08:18	06/04/15 17:07	7440-62-2	
Zinc, Dissolved	<b>293</b>	ug/L	5.0	1	06/04/15 08:18	06/04/15 17:07	7440-66-6	
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	ND	ug/L	0.20	1	06/03/15 07:05	06/03/15 20:15	7439-97-6	
<b>245.1 Mercury, Lab Filtered</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.20	1	06/04/15 09:35	06/04/15 14:26	7439-97-6	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

QC Batch: MERP/13704      Analysis Method: EPA 245.1  
QC Batch Method: EPA 245.1      Analysis Description: 245.1 Mercury  
Associated Lab Samples: 10308090001, 10308090002

METHOD BLANK: 1980230      Matrix: Water  
Associated Lab Samples: 10308090001, 10308090002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	06/03/15 19:31	

LABORATORY CONTROL SAMPLE: 1980231

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1980232      1980233

Parameter	Units	10308111002		MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Conc.	Spike Conc.	Result	Result	% Rec	% Rec	RPD	RPD				
Mercury	ug/L	<0.00020 mg/L	5	5	5.2	5.1	103	103	70-130	0	20			

MATRIX SPIKE SAMPLE: 1983255

Parameter	Units	10308090002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	5.2	103	70-130	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

QC Batch: MERP/13760      Analysis Method: EPA 245.1  
QC Batch Method: EPA 245.1      Analysis Description: 245.1 Mercury - Dissolved  
Associated Lab Samples: 10308090001, 10308090002

METHOD BLANK: 1984439      Matrix: Water  
Associated Lab Samples: 10308090001, 10308090002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.20	06/04/15 13:58	

LABORATORY CONTROL SAMPLE: 1984440

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	5	4.7	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1984441      1984442

Parameter	Units	10307763002		1984441		1984442		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury, Dissolved	ug/L	<0.20	5	5	5	4.8	4.9	96	98	70-130	2	20

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

QC Batch: MPRP/54784 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 10308090001, 10308090002

METHOD BLANK: 1980202 Matrix: Water  
Associated Lab Samples: 10308090001, 10308090002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	10.0	06/04/15 15:57	
Antimony	ug/L	ND	0.50	06/04/15 15:57	
Arsenic	ug/L	ND	0.50	06/04/15 15:57	
Barium	ug/L	ND	0.30	06/04/15 15:57	
Beryllium	ug/L	ND	0.20	06/04/15 15:57	
Cadmium	ug/L	ND	0.080	06/04/15 15:57	
Calcium	ug/L	ND	40.0	06/04/15 15:57	
Chromium	ug/L	ND	0.50	06/04/15 15:57	
Cobalt	ug/L	ND	0.50	06/04/15 15:57	
Copper	ug/L	ND	1.0	06/04/15 15:57	
Iron	ug/L	ND	50.0	06/04/15 15:57	
Lead	ug/L	ND	0.10	06/04/15 15:57	
Magnesium	ug/L	ND	10.0	06/04/15 15:57	
Manganese	ug/L	ND	0.50	06/04/15 15:57	
Nickel	ug/L	ND	0.50	06/04/15 15:57	
Potassium	ug/L	ND	50.0	06/04/15 15:57	
Selenium	ug/L	ND	0.50	06/04/15 15:57	
Silver	ug/L	ND	0.50	06/04/15 15:57	
Sodium	ug/L	ND	50.0	06/04/15 15:57	
Thallium	ug/L	ND	0.10	06/04/15 15:57	
Vanadium	ug/L	ND	1.0	06/04/15 15:57	
Zinc	ug/L	ND	5.0	06/04/15 15:57	

LABORATORY CONTROL SAMPLE: 1980203

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	80	79.9	100	85-115	
Antimony	ug/L	80	79.6	99	85-115	
Arsenic	ug/L	80	78.6	98	85-115	
Barium	ug/L	80	78.0	98	85-115	
Beryllium	ug/L	80	78.6	98	85-115	
Cadmium	ug/L	80	80.2	100	85-115	
Calcium	ug/L	1000	1010	101	85-115	
Chromium	ug/L	80	79.0	99	85-115	
Cobalt	ug/L	80	78.7	98	85-115	
Copper	ug/L	80	78.0	98	85-115	
Iron	ug/L	1000	960	96	85-115	
Lead	ug/L	80	78.0	98	85-115	
Magnesium	ug/L	1000	979	98	85-115	
Manganese	ug/L	80	78.4	98	85-115	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

LABORATORY CONTROL SAMPLE: 1980203

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	ug/L	80	79.0	99	85-115	
Potassium	ug/L	1000	968	97	85-115	
Selenium	ug/L	80	78.4	98	85-115	
Silver	ug/L	80	76.6	96	85-115	
Sodium	ug/L	1000	950	95	85-115	
Thallium	ug/L	80	81.3	102	85-115	
Vanadium	ug/L	80	77.8	97	85-115	
Zinc	ug/L	80	79.4	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1980204 1980205

Parameter	Units	10308090001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Aluminum	ug/L	ND	80	80	84.9	86.3	102	104	70-130	2	20		
Antimony	ug/L	ND	80	80	80.6	80.5	100	100	70-130	0	20		
Arsenic	ug/L	ND	80	80	81.5	79.0	102	98	70-130	3	20		
Barium	ug/L	25.5	80	80	105	105	100	99	70-130	0	20		
Beryllium	ug/L	ND	80	80	80.4	82.0	101	102	70-130	2	20		
Cadmium	ug/L	2.8	80	80	84.3	83.8	102	101	70-130	1	20		
Calcium	ug/L	63400	1000	1000	66400	66700	295	331	70-130	1	20	M1	
Chromium	ug/L	ND	80	80	80.8	79.8	101	100	70-130	1	20		
Cobalt	ug/L	ND	80	80	80.4	79.1	100	99	70-130	2	20		
Copper	ug/L	ND	80	80	80.0	80.6	99	100	70-130	1	20		
Iron	ug/L	ND	1000	1000	980	976	97	97	70-130	0	20		
Lead	ug/L	6.2	80	80	84.7	84.1	98	97	70-130	1	20		
Magnesium	ug/L	21000	1000	1000	22200	22400	123	147	70-130	1	20	M1	
Manganese	ug/L	2.0	80	80	80.9	79.8	99	97	70-130	1	20		
Nickel	ug/L	ND	80	80	78.0	77.4	97	97	70-130	1	20		
Potassium	ug/L	2630	1000	1000	3610	3590	98	96	70-130	1	20		
Selenium	ug/L	ND	80	80	80.8	78.6	101	98	70-130	3	20		
Silver	ug/L	ND	80	80	76.6	76.2	96	95	70-130	0	20		
Sodium	ug/L	5610	1000	1000	6600	6600	99	98	70-130	0	20		
Thallium	ug/L	ND	80	80	82.0	81.2	103	102	70-130	1	20		
Vanadium	ug/L	ND	80	80	79.2	78.5	99	98	70-130	1	20		
Zinc	ug/L	305	80	80	400	395	119	112	70-130	1	20		

MATRIX SPIKE SAMPLE: 1980206

Parameter	Units	10308207003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	9660	80	14700	6280	70-130	M1
Antimony	ug/L	<0.74	80	69.4	86	70-130	
Arsenic	ug/L	7.0	80	86.4	99	70-130	
Barium	ug/L	250	80	335	107	70-130	
Beryllium	ug/L	0.70J	80	79.2	98	70-130	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

MATRIX SPIKE SAMPLE:		1980206					
Parameter	Units	10308207003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium	ug/L	0.29J	80	81.4	101	70-130	
Calcium	ug/L	86300	1000	85400	-85	70-130	M1
Chromium	ug/L	16.5	80	99.9	104	70-130	
Cobalt	ug/L	7.7	80	86.2	98	70-130	
Copper	ug/L	17.8	80	94.6	96	70-130	
Iron	ug/L	16400	1000	17500	116	70-130	
Lead	ug/L	11.3	80	88.0	96	70-130	
Magnesium	ug/L	46000	1000	46100	6	70-130	M1
Manganese	ug/L	722	80	794	90	70-130	
Nickel	ug/L	19.3	80	95.6	95	70-130	
Potassium	ug/L	6160	1000	7680	153	70-130	M1
Selenium	ug/L	2.0J	80	79.7	97	70-130	
Silver	ug/L	<0.74	80	76.2	95	70-130	
Sodium	ug/L	35700	1000	35600	-11	70-130	M1
Thallium	ug/L	0.20J	80	79.9	100	70-130	
Vanadium	ug/L	30.4	80	116	107	70-130	
Zinc	ug/L	55.0	80	133	97	70-130	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

QC Batch: MPRP/54915      Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8      Analysis Description: 200.8 MET Dissolved  
Associated Lab Samples: 10308090001, 10308090002

METHOD BLANK: 1984384      Matrix: Water  
Associated Lab Samples: 10308090001, 10308090002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	10.0	06/04/15 14:56	
Antimony, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Arsenic, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Barium, Dissolved	ug/L	ND	0.30	06/04/15 14:56	
Beryllium, Dissolved	ug/L	ND	0.20	06/04/15 14:56	
Cadmium, Dissolved	ug/L	ND	0.080	06/04/15 14:56	
Calcium, Dissolved	ug/L	ND	40.0	06/04/15 14:56	
Chromium, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Cobalt, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Copper, Dissolved	ug/L	ND	1.0	06/04/15 14:56	
Iron, Dissolved	ug/L	ND	50.0	06/04/15 14:56	
Lead, Dissolved	ug/L	ND	0.10	06/04/15 14:56	
Magnesium, Dissolved	ug/L	ND	10.0	06/04/15 14:56	
Manganese, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Nickel, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Potassium, Dissolved	ug/L	ND	50.0	06/04/15 14:56	
Selenium, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Silver, Dissolved	ug/L	ND	0.50	06/04/15 14:56	
Sodium, Dissolved	ug/L	ND	50.0	06/04/15 14:56	
Thallium, Dissolved	ug/L	ND	0.10	06/04/15 14:56	
Vanadium, Dissolved	ug/L	ND	1.0	06/04/15 14:56	
Zinc, Dissolved	ug/L	ND	5.0	06/04/15 14:56	

LABORATORY CONTROL SAMPLE: 1984385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	80	88.9	111	85-115	
Antimony, Dissolved	ug/L	80	83.2	104	85-115	
Arsenic, Dissolved	ug/L	80	83.4	104	85-115	
Barium, Dissolved	ug/L	80	82.9	104	85-115	
Beryllium, Dissolved	ug/L	80	84.7	106	85-115	
Cadmium, Dissolved	ug/L	80	85.4	107	85-115	
Calcium, Dissolved	ug/L	1000	1020	102	85-115	
Chromium, Dissolved	ug/L	80	86.4	108	85-115	
Cobalt, Dissolved	ug/L	80	85.3	107	85-115	
Copper, Dissolved	ug/L	80	84.6	106	85-115	
Iron, Dissolved	ug/L	1000	1070	107	85-115	
Lead, Dissolved	ug/L	80	83.2	104	85-115	
Magnesium, Dissolved	ug/L	1000	1050	105	85-115	
Manganese, Dissolved	ug/L	80	83.8	105	85-115	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

LABORATORY CONTROL SAMPLE: 1984385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	80	85.5	107	85-115	
Potassium, Dissolved	ug/L	1000	1050	105	85-115	
Selenium, Dissolved	ug/L	80	81.4	102	85-115	
Silver, Dissolved	ug/L	80	87.1	109	85-115	
Sodium, Dissolved	ug/L	1000	1060	106	85-115	
Thallium, Dissolved	ug/L	80	87.8	110	85-115	
Vanadium, Dissolved	ug/L	80	84.7	106	85-115	
Zinc, Dissolved	ug/L	80	84.5	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1984386 1984387

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		30149308001 Result	Spike Conc.	Spike Conc.	MS Result								
Aluminum, Dissolved	ug/L	187	80	80	278	281	113	117	70-130	1	20		
Antimony, Dissolved	ug/L	ND	80	80	85.9	85.4	107	107	70-130	1	20		
Arsenic, Dissolved	ug/L	1.3	80	80	87.1	87.2	107	107	70-130	0	20		
Barium, Dissolved	ug/L	722	80	80	800	802	97	99	70-130	0	20		
Beryllium, Dissolved	ug/L	ND	80	80	80.0	78.6	100	98	70-130	2	20		
Cadmium, Dissolved	ug/L	ND	80	80	83.7	83.4	105	104	70-130	0	20		
Calcium, Dissolved	ug/L	640000	1000	1000	643000	643000	242	219	70-130	0	20	E,M1	
Chromium, Dissolved	ug/L	2.1	80	80	89.5	90.1	109	110	70-130	1	20		
Cobalt, Dissolved	ug/L	ND	80	80	85.3	86.1	106	107	70-130	1	20		
Copper, Dissolved	ug/L	ND	80	80	82.0	81.9	102	102	70-130	0	20		
Iron, Dissolved	ug/L	250	1000	1000	1320	1330	107	108	70-130	1	20		
Lead, Dissolved	ug/L	0.10	80	80	79.4	80.0	99	100	70-130	1	20		
Magnesium, Dissolved	ug/L	200	1000	1000	1290	1290	109	109	70-130	0	20		
Manganese, Dissolved	ug/L	39.6	80	80	124	125	105	106	70-130	1	20		
Nickel, Dissolved	ug/L	8.1	80	80	90.8	91.2	103	104	70-130	0	20		
Potassium, Dissolved	ug/L	83500	1000	1000	84800	84300	132	88	70-130	1	20	M1	
Selenium, Dissolved	ug/L	0.96	80	80	52.0	46.4	64	57	70-130	11	20	M1	
Silver, Dissolved	ug/L	ND	80	80	78.9	79.6	98	99	70-130	1	20		
Sodium, Dissolved	ug/L	330000	1000	1000	328000	327000	-226	-287	70-130	0	20	E,M1	
Thallium, Dissolved	ug/L	ND	80	80	82.8	83.5	103	104	70-130	1	20		
Vanadium, Dissolved	ug/L	4.8	80	80	93.6	94.1	111	112	70-130	0	20		
Zinc, Dissolved	ug/L	ND	80	80	88.2	86.5	106	104	70-130	2	20		

MATRIX SPIKE SAMPLE: 1984388

Parameter	Units	10308156001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	0.019 mg/L	80	109	113	70-130	
Antimony, Dissolved	ug/L	<0.00050 mg/L	80	83.2	104	70-130	
Arsenic, Dissolved	ug/L	<0.00050 mg/L	80	83.8	104	70-130	
Barium, Dissolved	ug/L	0.0019 mg/L	80	88.1	108	70-130	
Beryllium, Dissolved	ug/L	<0.00020 mg/L	80	81.4	102	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10308090

MATRIX SPIKE SAMPLE:		1984388					
Parameter	Units	10308156001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium, Dissolved	ug/L	<0.000080 mg/L	80	84.4	106	70-130	
Calcium, Dissolved	ug/L	1.0 mg/L	1000	2070	106	70-130	
Chromium, Dissolved	ug/L	<0.0010 mg/L	80	85.6	106	70-130	
Cobalt, Dissolved	ug/L	<0.00050 mg/L	80	85.1	106	70-130	
Copper, Dissolved	ug/L	<0.0010 mg/L	80	83.1	104	70-130	
Iron, Dissolved	ug/L	<0.050 mg/L	1000	1070	107	70-130	
Lead, Dissolved	ug/L	<0.00010 mg/L	80	86.3	108	70-130	
Magnesium, Dissolved	ug/L	0.24 mg/L	1000	1300	106	70-130	
Manganese, Dissolved	ug/L	<0.0040 mg/L	80	84.8	106	70-130	
Nickel, Dissolved	ug/L	<0.00050 mg/L	80	85.2	106	70-130	
Potassium, Dissolved	ug/L	0.12 mg/L	1000	1190	107	70-130	
Selenium, Dissolved	ug/L	<0.00050 mg/L	80	82.5	103	70-130	
Silver, Dissolved	ug/L	<0.00050 mg/L	80	82.1	103	70-130	
Sodium, Dissolved	ug/L	0.40 mg/L	1000	1680	128	70-130	
Thallium, Dissolved	ug/L	<0.00010 mg/L	80	89.4	112	70-130	
Vanadium, Dissolved	ug/L	<1.0	80	84.3	105	70-130	
Zinc, Dissolved	ug/L	<0.0080 mg/L	80	82.0	101	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Sierra Zinc

Pace Project No.: 10308090

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Sierra Zinc

Pace Project No.: 10308090

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10308090001	SZ-SW-Adit-5262015	EPA 200.8	MPRP/54784	EPA 200.8	ICPM/24622
10308090002	SZ-SW-Adit-05-5262015	EPA 200.8	MPRP/54784	EPA 200.8	ICPM/24622
10308090001	SZ-SW-Adit-5262015	EPA 200.8	MPRP/54915	EPA 200.8	ICPM/24643
10308090002	SZ-SW-Adit-05-5262015	EPA 200.8	MPRP/54915	EPA 200.8	ICPM/24643
10308090001	SZ-SW-Adit-5262015	EPA 245.1	MERP/13704	EPA 245.1	MERC/15990
10308090002	SZ-SW-Adit-05-5262015	EPA 245.1	MERP/13704	EPA 245.1	MERC/15990
10308090001	SZ-SW-Adit-5262015	EPA 245.1	MERP/13760	EPA 245.1	MERC/16000
10308090002	SZ-SW-Adit-05-5262015	EPA 245.1	MERP/13760	EPA 245.1	MERC/16000

### REPORT OF LABORATORY ANALYSIS

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Page: 10308090 of

1825892

**Section A**  
Required Client Information:  
Company: The Goldfield Corp.  
Address: 1684 W. Hibiscus Blvd  
Melbourne FL 32901  
Email To: lyndsey@rmc-ut.com  
Phone: 321.724.000 Fax:  
Requested Due Date/TAT: Standard

**Section B**  
Required Project Information:  
Report To: Lyndsey@rmc-ut.com  
Copy To: Jim @ rmc-ut.com  
Purchase Order No.:  
Project Name: Sierra Zinc  
Project Number:

**Section C**  
Invoice Information:  
Attention: Denise Diaz  
Company Name: The Goldfield Corporation  
Address: 1684 W. Hibiscus Blvd, Melbourne  
Face Quote Reference:  
Face Project Manager:  
Face Profile #:

**REGULATORY AGENCY**  
NPDES  GROUND WATER  DRINKING WATER  
UST  RCRA  OTHER

Site Location \_\_\_\_\_ STATE: \_\_\_\_\_

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see vaild codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START	COMPOSITE END/GRAB					
					DATE	TIME	DATE	TIME			
1	SZ-SW-Adit - SZ62015	DW WT WW P SL OL WP AR TS OT	WT	S26	06:40			2	Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Y	601 002
2	SZ-SW-Adit - 05 - SZ62015		WT		06:50			2	Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	N	
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

**ADDITIONAL COMMENTS**  
Lyndsey Fox

**RELINQUISHED BY / AFFILIATION**  
DATE: 5/29/15 TIME: 5:25pm  
Lyndsey Fox

**ACCEPTED BY / AFFILIATION**  
DATE: 5/29/15 TIME: 08:39am  
Lyndsey Fox

**SAMPLE CONDITIONS**  
Temp In °C \_\_\_\_\_  
Received on \_\_\_\_\_  
Ice (Y/N) \_\_\_\_\_  
Custody Sealed Cooler (Y/N) \_\_\_\_\_  
Samples Intact (Y/N) \_\_\_\_\_

**SAMPLER NAME AND SIGNATURE**  
PRINT Name of SAMPLER: Lyndsey Fox  
SIGNATURE OF SAMPLER: [Signature]  
DATE Signed (MM/DD/YYYY): 05/26/2015

ORIGINAL

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.



**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
pH, Temperature, Conductivity, Redox, Dissolved Oxygen, Flow	Field	NA	NA	Instream and/or Polyethylene	500 ml	NA	None	NA
<b>Metals Water - Total</b>								
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cd	EPA 200.8	0.032	0.08	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180




**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals Water- Dissolved</b>				Polyethylene	Bottle 2	6°C	See Note 5	180
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 2	6°C	See Note 5	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 2	6°C	See Note 5	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	See Note 5	180
Cd	EPA 200.8	0.032	0.08	Polyethylene	Bottle 1	6°C	See Note 5	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 2	6°C	See Note 5	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 2	6°C	See Note 5	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 2	6°C	See Note 5	180



	Document Name: <b>Sample Condition Upon Receipt Form</b>	Document Revised: 23Feb2015 Page 1 of 1
	Document No.: <b>F-MN-L-213-rev.13</b>	Issuing Authority: Pace Minnesota Quality Office

Sample Condition  
Upon Receipt

Client Name: The Goldfield Corp Project #: W0# : 10308090

**W0# : 10308090**



10308090

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  Speedee  Other: \_\_\_\_\_

Tracking Number: 803609371801

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No

Thermometer Used:  B88A9130516413  B88A912167504  B88A0143310098      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 3.7      Cooler Temp Corrected (°C): 3.9      Biological Tissue Frozen?  Yes  No  N/A

Temp should be above freezing to 6°C      Correction Factor: +0.2      Date and Initials of Person Examining Contents: KH5/28/15

USDA Regulated Soil  N/A, water sample)      Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?  Yes  No  N/A

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  N/A

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests? <u>KH5/28/15</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container <u>labelled</u>
Sample Labels Match COC? <u>WF</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: _____	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>F-2 1/1</u>
(HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Field Data Required?  Yes  No

Comments/Resolution: \_\_\_\_\_

**Project Manager Review:**

Kathy Xiang Date: May 29, 2015

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of old, incorrect preservative, out of temp, incorrect containers).





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1515907

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16920 (HBN: 150242)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11063 (HBN: 150299)  
**Analyzed By:** Penny A. Foote

## Blank

<b>LRB:</b> 450910 <b>Analyzed:</b> 06/10/2015 12:19 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 450911 <b>Analyzed:</b> 06/10/2015 12:22 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 450912 <b>Analyzed:</b> 06/10/2015 12:25 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 450913 <b>Analyzed:</b> 06/10/2015 12:29 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	103	100	103	88.0 115.0	108	108	4.51	0.0 15.0	

## QC Data Approved and Reviewed by

Penny A. Foote	Brittney Austin	6/10/2015
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: June 10, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1515907**

Client Project ID: Sierra Zinc 060815  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6042015</b>		Collected: 06/04/2015		
Lab ID: 1515907001	Sampling Location: Sierra Zinc		Received: 06/08/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/10/2015	
		Sampling Parameter: Air Volume 2826 L	Analyzed: 06/10/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00013	0.38	1.3

Sample ID: <b>SZ-AR-2-6042015</b>		Collected: 06/04/2015		
Lab ID: 1515907002	Sampling Location: Sierra Zinc		Received: 06/08/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/10/2015	
		Sampling Parameter: Air Volume 2784 L	Analyzed: 06/10/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00013	0.38	1.3

Sample ID: <b>SZ-AR-3-6042015</b>		Collected: 06/04/2015		
Lab ID: 1515907003	Sampling Location: Sierra Zinc		Received: 06/08/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/10/2015	
		Sampling Parameter: Air Volume 2716 L	Analyzed: 06/10/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Penny A. Foote 06/10/2015 15:06	/S/ Brittney Austin 06/10/2015 16:06

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: alsft.lab@ALSGlobal.com  
Web: www.alssl.com

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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# ANALYTICAL REPORT

Workorder: **34-1515907**

Client Project ID: Sierra Zinc 060815

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## General Lab Comments

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Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACCLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1516116

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16936 (HBN: 150352)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11071 (HBN: 150458)  
**Analyzed By:** Penny A. Foote

## Blank

<b>LRB:</b> 451178 <b>Analyzed:</b> 06/11/2015 17:23 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 451179 <b>Analyzed:</b> 06/11/2015 17:27 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 451180 <b>Analyzed:</b> 06/11/2015 17:30 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 451181 <b>Analyzed:</b> 06/11/2015 17:34 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	110	100	110	88.0 115.0	109	109	0.649	0.0 15.0	

## QC Data Approved and Reviewed by

Penny A. Foote	Neil A. Edwards	6/12/2015
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
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- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: June 12, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1516116**

Client Project ID: Sierra Zinc 061015

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-60682015</b>		Collected: 06/08/2015		
Lab ID: 1516116001	Sampling Location: Sierra Zinc		Received: 06/10/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/11/2015	
		Sampling Parameter: Air Volume 2584 L	Analyzed: 06/11/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-2-60682015</b>		Collected: 06/08/2015		
Lab ID: 1516116002	Sampling Location: Sierra Zinc		Received: 06/10/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/11/2015	
		Sampling Parameter: Air Volume 2576 L	Analyzed: 06/11/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-3-60682015</b>		Collected: 06/08/2015		
Lab ID: 1516116003	Sampling Location: Sierra Zinc		Received: 06/10/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/11/2015	
		Sampling Parameter: Air Volume 2540 L	Analyzed: 06/11/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Penny A. Foote 06/12/2015 14:06	/S/ Neil A. Edwards 06/12/2015 17:06

## Laboratory Contact Information

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960 W LeVoy Drive  
Salt Lake City, Utah 84123

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Email: alsft.lab@ALSGlobal.com  
Web: www.alssl.com

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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# ANALYTICAL REPORT

Workorder: **34-1516116**

Client Project ID: Sierra Zinc 061015

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## General Lab Comments

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	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	AClass (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	AClass (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

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( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1516275

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16942 (HBN: 150433)  
**Prepared By:** Karley Neilson

**Analysis:** IH Metals QC  
**Batch:** IICP/11076 (HBN: 150536)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 451346 <b>Analyzed:</b> 06/15/2015 11:37 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 451347 <b>Analyzed:</b> 06/15/2015 11:41 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	0.566	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 451348 <b>Analyzed:</b> 06/15/2015 11:44 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 451349 <b>Analyzed:</b> 06/15/2015 11:47 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	101	100	101	88.0 115.0	102	102	1.13	0.0 15.0	

## QC Data Approved and Reviewed by

Peter P. Steen <hr/> <b>Analyst</b>	Neil A. Edwards <hr/> <b>Peer Review</b>	6/15/2015 <hr/> <b>Date</b>
--	---	--------------------------------

## Symbols and Definitions

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RPD - Relative % Difference (Spike / Spike Duplicate)  
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# ANALYTICAL REPORT

Report Date: June 15, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1516275**

Client Project ID: Sierra Zinc 061115  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6092015</b>		Collected: 06/08/2015		
Lab ID: 1516275001	Sampling Location: Sierra Zinc		Received: 06/11/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/12/2015	
		Sampling Parameter: Air Volume 2560 L	Analyzed: 06/15/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-2-6092015</b>		Collected: 06/08/2015		
Lab ID: 1516275002	Sampling Location: Sierra Zinc		Received: 06/11/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/12/2015	
		Sampling Parameter: Air Volume 2564 L	Analyzed: 06/15/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-3-6092015</b>		Collected: 06/08/2015		
Lab ID: 1516275003	Sampling Location: Sierra Zinc		Received: 06/11/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/12/2015	
		Sampling Parameter: Air Volume 2556 L	Analyzed: 06/15/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 06/15/2015 14:06	/S/ Neil A. Edwards 06/15/2015 16:06

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
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# ANALYTICAL REPORT

Workorder: **34-1516275**

Client Project ID: Sierra Zinc 061115

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

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	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

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# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1516321

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16954 (HBN: 150516)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11079 (HBN: 150617)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 451601 <b>Analyzed:</b> 06/16/2015 08:48 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 451602 <b>Analyzed:</b> 06/16/2015 08:51 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 451603 <b>Analyzed:</b> 06/16/2015 08:54 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 451604 <b>Analyzed:</b> 06/16/2015 08:58 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	106	100	106	88.0 115.0	106	106	0.746	0.0 15.0	

## QC Data Approved and Reviewed by

Peter P. Steen	Lauren Jones	6/16/2015
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

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# ANALYTICAL REPORT

Report Date: June 16, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1516321**

Client Project ID: Sierra Zinc 061215  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6102015</b>		Collected: 06/10/2015		
Lab ID: 1516321001	Sampling Location: Sierra Zinc		Received: 06/12/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/15/2015	
		Sampling Parameter: Air Volume 2634 L	Analyzed: 06/16/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-2-6102015</b>		Collected: 06/10/2015		
Lab ID: 1516321002	Sampling Location: Sierra Zinc		Received: 06/12/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/15/2015	
		Sampling Parameter: Air Volume 2616 L	Analyzed: 06/16/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-3-6102015</b>		Collected: 06/10/2015		
Lab ID: 1516321003	Sampling Location: Sierra Zinc		Received: 06/12/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/15/2015	
		Sampling Parameter: Air Volume 2520 L	Analyzed: 06/16/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 06/16/2015 11:06	/S/ Lauren Jones 06/16/2015 13:06

## Laboratory Contact Information

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# ANALYTICAL REPORT

Workorder: **34-1516321**

Client Project ID: Sierra Zinc 061215

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

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	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	AClass (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	AClass (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1516606

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/16975 (HBN: 150634)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11089 (HBN: 150726)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 451895 <b>Analyzed:</b> 06/17/2015 10:07 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 451896 <b>Analyzed:</b> 06/17/2015 10:10 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 451897 <b>Analyzed:</b> 06/17/2015 10:14 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 451898 <b>Analyzed:</b> 06/17/2015 10:17 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	107	100	107	88.0 115.0	106	106	1.20	0.0 15.0	

## Comments

The zinc recoveries for quartz fiber filter LCS 451448 and LCSD 451449 are high outside current LCS limits but within +/- 20% so the data is reported as is without further comment.

## QC Data Approved and Reviewed by

<u>Peter P. Steen</u> <b>Analyst</b>	<u>Neil A. Edwards</u> <b>Peer Review</b>	<u>6/17/2015</u> <b>Date</b>
---	--	---------------------------------

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
  - ▲ - Sample result is greater than 4 times the spike added
  - - Sample and Matrix Duplicate less than 5 times the reporting limit
- RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: June 17, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
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Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1516606**

Client Project ID: Sierra Zinc 061515  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6112015</b>		Collected: 06/11/2015		
Lab ID: 1516606001	Sampling Location: Sierra Zinc		Received: 06/15/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/16/2015	
		Sampling Parameter: Air Volume 2760 L	Analyzed: 06/17/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-2-6112015</b>		Collected: 06/11/2015		
Lab ID: 1516606002	Sampling Location: Sierra Zinc		Received: 06/15/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/16/2015	
		Sampling Parameter: Air Volume 2776 L	Analyzed: 06/17/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-3-6112015</b>		Collected: 06/11/2015		
Lab ID: 1516606003	Sampling Location: Sierra Zinc		Received: 06/15/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/16/2015	
		Sampling Parameter: Air Volume 2776 L	Analyzed: 06/17/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

## Comments

### Quality Control: NIOSH 7300 Mod. - (HBN: 150726)

The zinc recoveries for quartz fiber filter LCS 451448 and LCSD 451449 are high outside current LCS limits but within +/- 20% so the data is reported as is without further comment.

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 06/17/2015 15:06	/S/ Neil A. Edwards 06/17/2015 18:06

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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# ANALYTICAL REPORT

Workorder: **34-1516606**

Client Project ID: Sierra Zinc 061515

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## Laboratory Contact Information

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Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: [alslt.lab@ALSGlobal.com](mailto:alslt.lab@ALSGlobal.com)  
Web: [www.alssl.com](http://www.alssl.com)

## General Lab Comments

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Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACCLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

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ND = Not Detected, Testing result not detected above the LOD or LOQ.  
NA = Not Applicable.  
\*\* No result could be reported, see sample comments for details.  
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( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# ANALYTICAL REPORT

Report Date: June 22, 2015

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8496 S Harrison Street  
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Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1516938**

Client Project ID: Sierra Zinc 061815  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6162015</b>		Collected: 06/16/2015		
Lab ID: 1516938001	Sampling Location: Sierra Zinc		Received: 06/18/2015	
Method: NIOSH 7300 Mod.		Media: Filter Type not Specified	Prepared: 06/18/2015	
		Sampling Parameter: Air Volume 2632 L	Analyzed: 06/22/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-2-6162015</b>		Collected: 06/16/2015		
Lab ID: 1516938002	Sampling Location: Sierra Zinc		Received: 06/18/2015	
Method: NIOSH 7300 Mod.		Media: Filter Type not Specified	Prepared: 06/18/2015	
		Sampling Parameter: Air Volume 2640 L	Analyzed: 06/22/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-3-6162015</b>		Collected: 06/16/2015		
Lab ID: 1516938003	Sampling Location: Sierra Zinc		Received: 06/18/2015	
Method: NIOSH 7300 Mod.		Media: Filter Type not Specified	Prepared: 06/18/2015	
		Sampling Parameter: Air Volume 2652 L	Analyzed: 06/22/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 06/22/2015 15:06	/S/ Lauren Jones 06/22/2015 15:06

## Laboratory Contact Information

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Web: www.alssl.com

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# ANALYTICAL REPORT

Workorder: **34-1516938**

Client Project ID: Sierra Zinc 061815

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## General Lab Comments

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	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

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NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

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( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1516938

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/17001 (HBN: 150832)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11104 (HBN: 151025)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 452439 <b>Analyzed:</b> 06/22/2015 13:23 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 452440 <b>Analyzed:</b> 06/22/2015 13:27 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 452441 <b>Analyzed:</b> 06/22/2015 13:31 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 452442 <b>Analyzed:</b> 06/22/2015 13:34 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	99.3	100	99.3	88.0 115.0	97.5	97.5	1.74	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Peter P. Steen</u>	<u>Lauren Jones</u>	<u>6/22/2015</u>
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1518005

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/17067 (HBN: 151488)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11138 (HBN: 151589)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 454257 <b>Analyzed:</b> 07/01/2015 09:23 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 454258 <b>Analyzed:</b> 07/01/2015 09:26 <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 454259 <b>Analyzed:</b> 07/01/2015 09:30 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 454260 <b>Analyzed:</b> 07/01/2015 09:33 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	100	100	100	88.0 115.0	104	104	3.41	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Peter P. Steen</u>	<u>Lauren Jones</u>	<u>7/1/2015</u>
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: July 01, 2015

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Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
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Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1518005**

Client Project ID: Sierra Zinc 062915  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-2-6232015</b>		Collected: 06/23/2015		
Lab ID: 1518005001	Sampling Location: Sierra Zinc		Received: 06/29/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/30/2015	
		Sampling Parameter: Air Volume 2508 L	Analyzed: 07/01/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-1-6232015</b>		Collected: 06/23/2015		
Lab ID: 1518005002	Sampling Location: Sierra Zinc		Received: 06/29/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/30/2015	
		Sampling Parameter: Air Volume 2516 L	Analyzed: 07/01/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-1-6252015</b>		Collected: 06/23/2015		
Lab ID: 1518005003	Sampling Location: Sierra Zinc		Received: 06/29/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/30/2015	
		Sampling Parameter: Air Volume 2644 L	Analyzed: 07/01/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-2-6252015</b>		Collected: 06/23/2015		
Lab ID: 1518005004	Sampling Location: Sierra Zinc		Received: 06/29/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 06/30/2015	
		Sampling Parameter: Air Volume 2640 L	Analyzed: 07/01/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

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# ANALYTICAL REPORT

Workorder: **34-1518005**

Client Project ID: Sierra Zinc 062915

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

**Report Authorization** (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 07/01/2015 13:07	/S/ Lauren Jones 07/01/2015 14:07

## Laboratory Contact Information

ALS Environmental  
960 W Levoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: [alslt.lab@ALSGlobal.com](mailto:alslt.lab@ALSGlobal.com)  
Web: [www.alssl.com](http://www.alssl.com)

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	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	AClass (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	AClass (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1518721

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/17100 (HBN: 151780)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11155 (HBN: 151844)  
**Analyzed By:** Peter P. Steen

## Blank

<b>LRB:</b> 455117 <b>Analyzed:</b> 07/07/2015 13:13  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 455118 <b>Analyzed:</b> 07/07/2015 13:17  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 455119 <b>Analyzed:</b> 07/07/2015 13:21 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 455120 <b>Analyzed:</b> 07/07/2015 13:24 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	100	100	100	88.0 115.0	99.4	99.4	0.630	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Peter P. Steen</u>	<u>Lauren Jones</u>	<u>7/7/2015</u>
<b>Analyst</b>	<b>Peer Review</b>	<b>Date</b>

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: July 07, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1518721**

Client Project ID: Sierra Zinc 070615  
Purchase Order: Sierra Zinc  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-6302015</b>	Collected: 06/30/2015			
Lab ID: 1518721001	Received: 07/06/2015			
Method: NIOSH 7300 Mod.	Media: MCE Filter			
	Prepared: 07/07/2015			
	Analyzed: 07/07/2015			
	Sampling Parameter: Air Volume 2736 L			
<b>Analyte</b>	<b>ug/sample</b>	<b>mg/m<sup>3</sup></b>	<b>LOD (ug/sample)</b>	<b>RL (ug/sample)</b>
Lead	<0.38	<0.00014	0.38	1.3

Sample ID: <b>SZ-AR-2-6302015</b>	Collected: 06/30/2015			
Lab ID: 1518721002	Received: 07/06/2015			
Method: NIOSH 7300 Mod.	Media: MCE Filter			
	Prepared: 07/07/2015			
	Analyzed: 07/07/2015			
	Sampling Parameter: Air Volume 2708 L			
<b>Analyte</b>	<b>ug/sample</b>	<b>mg/m<sup>3</sup></b>	<b>LOD (ug/sample)</b>	<b>RL (ug/sample)</b>
Lead	<0.38	<0.00014	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 07/07/2015 15:07	/S/ Lauren Jones 07/07/2015 16:07

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: als@alst.com  
Web: www.alssl.com

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company

Environmental

[www.alsglobal.com](http://www.alsglobal.com)

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# ANALYTICAL REPORT

Workorder: **34-1518721**

Client Project ID: Sierra Zinc 070615

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## General Lab Comments

The results provided in this report relate only to the items tested.  
Samples were received in acceptable condition unless otherwise noted.  
Samples have not been blank corrected unless otherwise noted.  
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACCLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.



July 13, 2015

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

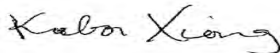
RE: Project: Sierra Zinc  
Pace Project No.: 10312517

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on June 29, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim, Resource Management Consultants



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Sierra Zinc  
Pace Project No.: 10312517

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: Sierra Zinc  
Pace Project No.: 10312517

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10312517001	DU2-18	Solid	06/23/15 10:32	06/29/15 08:40
10312517002	DU10-5	Solid	06/23/15 13:13	06/29/15 08:40

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Sierra Zinc

Pace Project No.: 10312517

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10312517001	DU2-18	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10312517002	DU10-5	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	LMW	1	PASI-M
		ASTM D2974	JDL	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc  
Pace Project No.: 10312517

**Sample: DU2-18**      **Lab ID: 10312517001**      Collected: 06/23/15 10:32      Received: 06/29/15 08:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b> Analytical Method: EPA 6020A      Preparation Method: EPA 3050								
Aluminum	5930	mg/kg	8.3	20	07/10/15 05:32	07/10/15 09:58	7429-90-5	M6
Antimony	ND	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7440-36-0	
Arsenic	1.7	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7440-38-2	
Barium	45.5	mg/kg	0.25	20	07/10/15 05:32	07/10/15 09:58	7440-39-3	M6
Beryllium	0.24	mg/kg	0.17	20	07/10/15 05:32	07/10/15 09:58	7440-41-7	
Cadmium	0.72	mg/kg	0.066	20	07/10/15 05:32	07/10/15 09:58	7440-43-9	
Calcium	3100	mg/kg	33.1	20	07/10/15 05:32	07/10/15 09:58	7440-70-2	M6
Chromium	8.0	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7440-47-3	
Cobalt	3.4	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7440-48-4	
Copper	11.1	mg/kg	0.83	20	07/10/15 05:32	07/10/15 09:58	7440-50-8	
Iron	10900	mg/kg	41.3	20	07/10/15 05:32	07/10/15 09:58	7439-89-6	M6
Lead	49.6	mg/kg	0.083	20	07/10/15 05:32	07/10/15 09:58	7439-92-1	M6, R1
Magnesium	3000	mg/kg	8.3	20	07/10/15 05:32	07/10/15 09:58	7439-95-4	M6
Manganese	211	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7439-96-5	M6, R1
Nickel	6.7	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7440-02-0	
Potassium	1350	mg/kg	41.3	20	07/10/15 05:32	07/10/15 09:58	7440-09-7	M6
Selenium	ND	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7782-49-2	
Silver	ND	mg/kg	0.41	20	07/10/15 05:32	07/10/15 09:58	7440-22-4	
Sodium	76.4	mg/kg	41.3	20	07/10/15 05:32	07/10/15 09:58	7440-23-5	
Thallium	ND	mg/kg	0.083	20	07/10/15 05:32	07/10/15 09:58	7440-28-0	
Vanadium	17.6	mg/kg	0.83	20	07/10/15 05:32	07/10/15 09:58	7440-62-2	
Zinc	328	mg/kg	4.1	20	07/10/15 05:32	07/10/15 09:58	7440-66-6	M6

**7471B Mercury**      Analytical Method: EPA 7471B      Preparation Method: EPA 7471B

Mercury	ND	mg/kg	0.018	1	07/02/15 17:44	07/05/15 17:48	7439-97-6	
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**Dry Weight**      Analytical Method: ASTM D2974

Percent Moisture	0.86	%	0.10	1		07/10/15 16:12		
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**Sample: DU10-5**      **Lab ID: 10312517002**      Collected: 06/23/15 13:13      Received: 06/29/15 08:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b> Analytical Method: EPA 6020A      Preparation Method: EPA 3050								
Aluminum	9480	mg/kg	10.9	20	07/10/15 05:32	07/10/15 09:55	7429-90-5	
Antimony	ND	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7440-36-0	
Arsenic	3.9	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7440-38-2	
Barium	83.7	mg/kg	0.33	20	07/10/15 05:32	07/10/15 09:55	7440-39-3	
Beryllium	0.33	mg/kg	0.22	20	07/10/15 05:32	07/10/15 09:55	7440-41-7	
Cadmium	1.2	mg/kg	0.087	20	07/10/15 05:32	07/10/15 09:55	7440-43-9	
Calcium	35300	mg/kg	217	100	07/10/15 05:32	07/10/15 17:15	7440-70-2	
Chromium	23.6	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7440-47-3	
Cobalt	5.6	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7440-48-4	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc

Pace Project No.: 10312517

**Sample: DU10-5**      **Lab ID: 10312517002**      Collected: 06/23/15 13:13      Received: 06/29/15 08:40      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Copper	<b>14.3</b>	mg/kg	1.1	20	07/10/15 05:32	07/10/15 09:55	7440-50-8	
Iron	<b>17200</b>	mg/kg	54.4	20	07/10/15 05:32	07/10/15 09:55	7439-89-6	
Lead	<b>37.9</b>	mg/kg	0.11	20	07/10/15 05:32	07/10/15 09:55	7439-92-1	
Magnesium	<b>9290</b>	mg/kg	10.9	20	07/10/15 05:32	07/10/15 09:55	7439-95-4	
Manganese	<b>189</b>	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7439-96-5	
Nickel	<b>15.6</b>	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7440-02-0	
Potassium	<b>1680</b>	mg/kg	54.4	20	07/10/15 05:32	07/10/15 09:55	7440-09-7	
Selenium	ND	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7782-49-2	
Silver	ND	mg/kg	0.54	20	07/10/15 05:32	07/10/15 09:55	7440-22-4	
Sodium	<b>182</b>	mg/kg	54.4	20	07/10/15 05:32	07/10/15 09:55	7440-23-5	
Thallium	<b>0.13</b>	mg/kg	0.11	20	07/10/15 05:32	07/10/15 09:55	7440-28-0	
Vanadium	<b>25.1</b>	mg/kg	1.1	20	07/10/15 05:32	07/10/15 09:55	7440-62-2	
Zinc	<b>247</b>	mg/kg	5.4	20	07/10/15 05:32	07/10/15 09:55	7440-66-6	
<b>7471B Mercury</b>		Analytical Method: EPA 7471B    Preparation Method: EPA 7471B						
Mercury	ND	mg/kg	0.021	1	07/02/15 17:44	07/05/15 17:50	7439-97-6	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>19.3</b>	%	0.10	1		07/10/15 16:13		

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10312517

QC Batch: MERP/14085      Analysis Method: EPA 7471B  
QC Batch Method: EPA 7471B      Analysis Description: 7471B Mercury Solids  
Associated Lab Samples: 10312517001, 10312517002

METHOD BLANK: 2011531      Matrix: Solid  
Associated Lab Samples: 10312517001, 10312517002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.019	07/05/15 17:13	

LABORATORY CONTROL SAMPLE: 2011532

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.43	0.43	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2011533      2011534

Parameter	Units	2011533		2011534		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Qual
		10312174001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury	mg/kg	ND	.45	.48	0.45	0.48	97	98	75-125	7	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10312517

QC Batch: MPRP/55904      Analysis Method: EPA 6020A  
QC Batch Method: EPA 3050      Analysis Description: 6020A Solids UPD4  
Associated Lab Samples: 10312517001, 10312517002

METHOD BLANK: 2017409      Matrix: Solid  
Associated Lab Samples: 10312517001, 10312517002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	8.3	07/10/15 09:47	
Antimony	mg/kg	ND	0.41	07/10/15 09:47	
Arsenic	mg/kg	ND	0.41	07/10/15 09:47	
Barium	mg/kg	ND	0.25	07/10/15 09:47	
Beryllium	mg/kg	ND	0.17	07/10/15 09:47	
Cadmium	mg/kg	ND	0.066	07/10/15 09:47	
Calcium	mg/kg	ND	33.1	07/10/15 09:47	
Chromium	mg/kg	ND	0.41	07/10/15 09:47	
Cobalt	mg/kg	ND	0.41	07/10/15 09:47	
Copper	mg/kg	ND	0.83	07/10/15 09:47	
Iron	mg/kg	ND	41.3	07/10/15 09:47	
Lead	mg/kg	ND	0.083	07/10/15 09:47	
Magnesium	mg/kg	ND	8.3	07/10/15 09:47	
Manganese	mg/kg	ND	0.41	07/10/15 09:47	
Nickel	mg/kg	ND	0.41	07/10/15 09:47	
Potassium	mg/kg	ND	41.3	07/10/15 09:47	
Selenium	mg/kg	ND	0.41	07/10/15 09:47	
Silver	mg/kg	ND	0.41	07/10/15 09:47	
Sodium	mg/kg	ND	41.3	07/10/15 09:47	
Thallium	mg/kg	ND	0.083	07/10/15 09:47	
Vanadium	mg/kg	ND	0.83	07/10/15 09:47	
Zinc	mg/kg	ND	4.1	07/10/15 09:47	

LABORATORY CONTROL SAMPLE: 2017410

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	18.3	20.7	113	80-120	
Antimony	mg/kg	18.3	19.1	104	80-120	
Arsenic	mg/kg	18.3	19.1	104	80-120	
Barium	mg/kg	18.3	19.3	105	80-120	
Beryllium	mg/kg	18.3	18.1	99	80-120	
Cadmium	mg/kg	18.3	20.1	109	80-120	
Calcium	mg/kg	229	243	106	80-120	
Chromium	mg/kg	18.3	20.9	114	80-120	
Cobalt	mg/kg	18.3	19.7	108	80-120	
Copper	mg/kg	18.3	20.6	112	80-120	
Iron	mg/kg	229	261	114	80-120	
Lead	mg/kg	18.3	20.6	112	80-120	
Magnesium	mg/kg	229	256	112	80-120	
Manganese	mg/kg	18.3	21.2	115	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10312517

LABORATORY CONTROL SAMPLE: 2017410

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	mg/kg	18.3	20.5	112	80-120	
Potassium	mg/kg	229	258	112	80-120	
Selenium	mg/kg	18.3	18.5	101	80-120	
Silver	mg/kg	18.3	20.4	111	80-120	
Sodium	mg/kg	229	249	109	80-120	
Thallium	mg/kg	18.3	20.7	113	80-120	
Vanadium	mg/kg	18.3	20.4	111	80-120	
Zinc	mg/kg	18.3	20.5	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2017411 2017412

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10312517001 Result	Spike Conc.	Spike Conc.	MS Result							
Aluminum	mg/kg	5930	16.5	16.5	6820	7140	5380	7280	75-125	4	20	M6
Antimony	mg/kg	ND	16.5	16.5	13.8	13.1	83	78	75-125	5	20	
Arsenic	mg/kg	1.7	16.5	16.5	20.2	19.6	112	109	75-125	3	20	
Barium	mg/kg	45.5	16.5	16.5	68.5	74.1	139	173	75-125	8	20	M6
Beryllium	mg/kg	0.24	16.5	16.5	16.9	16.3	101	97	75-125	4	20	
Cadmium	mg/kg	0.72	16.5	16.5	19.1	18.1	111	105	75-125	6	20	
Calcium	mg/kg	3100	207	207	3570	3520	223	201	75-125	1	20	M6
Chromium	mg/kg	8.0	16.5	16.5	26.2	26.2	110	111	75-125	0	20	
Cobalt	mg/kg	3.4	16.5	16.5	21.3	21.1	108	107	75-125	1	20	
Copper	mg/kg	11.1	16.5	16.5	29.6	30.5	112	117	75-125	3	20	
Iron	mg/kg	10900	207	207	11600	12500	374	806	75-125	7	20	M6
Lead	mg/kg	49.6	16.5	16.5	74.7	115	152	396	75-125	42	20	M6, R1
Magnesium	mg/kg	3000	207	207	3490	3370	238	180	75-125	3	20	M6
Manganese	mg/kg	211	16.5	16.5	249	325	230	693	75-125	27	20	M6, R1
Nickel	mg/kg	6.7	16.5	16.5	25.3	25.3	113	113	75-125	0	20	
Potassium	mg/kg	1350	207	207	1690	1720	164	177	75-125	2	20	M6
Selenium	mg/kg	ND	16.5	16.5	17.5	16.5	105	99	75-125	6	20	
Silver	mg/kg	ND	16.5	16.5	18.7	18.0	112	108	75-125	4	20	
Sodium	mg/kg	76.4	207	207	313	329	114	122	75-125	5	20	
Thallium	mg/kg	ND	16.5	16.5	18.6	17.6	112	106	75-125	5	20	
Vanadium	mg/kg	17.6	16.5	16.5	38.1	38.1	124	124	75-125	0	20	
Zinc	mg/kg	328	16.5	16.5	418	418	545	543	75-125	0	20	E, M6

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc

Pace Project No.: 10312517

QC Batch: MPRP/55970

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10312517001, 10312517002

SAMPLE DUPLICATE: 2019294

Parameter	Units	10312517001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	0.86	0.83	3	30	

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Sierra Zinc  
Pace Project No.: 10312517

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Sierra Zinc

Pace Project No.: 10312517

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10312517001	DU2-18	EPA 3050	MPRP/55904	EPA 6020A	ICPM/25296
10312517002	DU10-5	EPA 3050	MPRP/55904	EPA 6020A	ICPM/25296
10312517001	DU2-18	EPA 7471B	MERP/14085	EPA 7471B	MERC/16421
10312517002	DU10-5	EPA 7471B	MERP/14085	EPA 7471B	MERC/16421
10312517001	DU2-18	ASTM D2974	MPRP/55970		
10312517002	DU10-5	ASTM D2974	MPRP/55970		

### REPORT OF LABORATORY ANALYSIS

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# Surface Water / Soil COC RMC

## Laboratory Services Request Form

63015  
103119 10312517

I. CLIENT INFORMATION	SEND REQUESTS TO:
Client Name: <u>The Goldfield Corporation – Denise Diaz</u>	<b>Pace Analytical Services, Inc.</b> 1700 Elm Street Minneapolis MN, 55414  Lori Castille Phone: (612) 607-6402
Client Address: <u>1684 W. Hibiscus Blvd. Melbourne, Florida 32901-2631</u>	
Client Phone: <u>321.724.1700</u>	
Client Fax: <u>321.308.1164</u>	
II. ACCOUNT INFORMATION	
Project Name: <u>Sierra Zinc</u>	
Sample Questions: <u>Lyndsey Fox RMC- 801-255-2626</u>	
TAT: <u>Standard</u>	
P.O. No: _____	

III. REPORT INSTRUCTIONS
Report Results To: <u>Lyndsey Fox – RMC (Lyndsey@rmc-ut.com)</u>
Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street, Suite 102, MIDVALE UT 84047</u>
Please Forward Results By: US Mail ( ) Fed Ex ( ) Fax ( ) Email (X) <u>Lyndsey@rmc-ut.com</u>
Services Requested below are required no later than _____ (date)

IV. TYPE OF SERVICE REQUESTED				
Please analyze the enclosed environmental samples for:				
Lab Use Only Lab No.	Field Sample No./Description	Sampling Date & Time	No. of Cont.	Analysis Requested
	<u>DU2-18 (composite sample)</u>	<u>10:32</u>	<u>1</u>	<u>See Attached table</u>
	<u>DU10-5</u>	<u>6/23 13:13</u>	<u>1</u>	<u>See Attached table</u>
				<u>All samples collected in WA</u>
notes: _____				

V. CHAIN OF CUSTODY RECORD				
Dispatched by: <u>Lyndsey Fox</u>	Date: <u>6/25/2015</u>	Time: <u>6:04 pm</u>	Courier Co. Name	
Relinquished by: _____	Date	Time	Airbill #	
Received by: <u>MAS - PAC</u>	Date: <u>6/25/15</u>	Time: <u>0840</u>	Custody Seal Intact?	
Received for lab by: _____	Date	Time	Yes <span style="float: right;">No <input checked="" type="radio"/></span>	

T = 22.5°C



Table 1  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals - Solids (Soil, Rock, Sediments and Tailings)</b>								
		mg/kg	mg/kg					
Al	EPA 6020	2.00	4.00	Glass or Polyethylene	Jar 1	6°C	None	180
Sb	EPA 6020	0.104	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
As	EPA 6020	0.188	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ba	EPA 6020	0.088	0.30	Glass or Polyethylene	Jar 1	6°C	None	180
Be	EPA 6020	0.058	0.20	Glass or Polyethylene	Jar 1	6°C	None	180
Cd	EPA 6020	0.024	0.08	Glass or Polyethylene	Jar 1	6°C	None	180
Ca	EPA 6020	10.00	20.00	Glass or Polyethylene	Jar 1	6°C	None	180
Cr	EPA 6020	0.173	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Co	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Cu	EPA 6020	0.250	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Fe	EPA 6020	10.67	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Pb	EPA 6020	0.030	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
Mg	EPA 6020	2.50	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Mn	EPA 6020	0.108	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ni	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
K	EPA 6020	9.86	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Se	EPA 6020	0.198	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ag	EPA 6020	0.207	0.5	Glass or Polyethylene	Jar 1	6°C	None	180
Na	EPA 6020	20.74	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Th	EPA 6020	0.036	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
V	EPA 6020	0.050	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Zn	EPA 6020	1.15	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Hg	EPA 7471	0.006	0.02	Glass or Polyethylene	Jar 1	6°C	None	180

N/A - Not Applicable TBD - To be determined

Action limits TBD

<sup>1</sup> - Parameters to be collected at each location may vary, detection limits and methods may vary by location and anticipated concentrations.

<sup>2</sup> - All units in ug/L except as noted.

<sup>3</sup> - See bottle list for sample volumes at each sample station. Actual bottle list will be dependent on parameter list for each event and lab requirements.

<sup>4</sup> - Laboratory will measure the temperature of each cooler upon receipt to ensure proper temperature was maintained (4°C +/- 2°C)

<sup>5</sup> - Filtering and preservation may be conducted by Laboratory, field filtered samples will be preserved with HNO<sub>3</sub> (pH<2)

Bottle 1 - TBD volume bottle unfiltered and preserved with HNO<sub>3</sub> for Total Metals.

Bottle 2 - TBD volume bottle. Preserved with HNO<sub>3</sub> after field filtering for Dissolved Metals or unfiltered and unpreserved for laboratory filtered Dissolved Metals.

Jar 1 - To be supplied by laboratory.



Sample Condition  
Upon Receipt

Client Name: RMC

Project #:

**WO# : 10312517**



10312517

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other:  
 Tracking Number: 805608342731

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date:      Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other:      Temp Blank?  Yes  No

Thermometer Used:  B88A9130516413  B88A912167504  B88A0143310098  
 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 22.8 Cooler Temp Corrected (°C): 22.5 Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C Correction Factor: -0.3 Date and Initials of Person Examining Contents: [Signature]

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, MD, IA, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>No Date on label.</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample # Initial when completed:      Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/Resolution: Temp ok for metals

Project Manager Review: [Signature]

Date: June 30, 2015

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).



*Hand Sampled*

**Pace Analytical**

Document Name: Document Revised: 30Jul2014  
 Sample Container Count Page 1 of 1  
 Document No.: Issuing Authority:  
 F-MN-C-090-Rev.04 Pace Minnesota Quality Office

Client: \_\_\_\_\_ Project #: \_\_\_\_\_ COC ID: \_\_\_\_\_ COC Page: \_\_\_\_\_ of \_\_\_\_\_

Sample Line Item	BP1U	BP2U	BP3U	BP3S	BP3N	AG1U	AG1H	AG3S	AGIT	JGFU	JCCU	BJFU	WPDU	VG9M	VG9H	GN	SP5T	DWC	
<input type="checkbox"/>	Check the box to the left to indicate that the container(s) received for line items are identical to the container(s) documented for line item 1 for this CoC.																		
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

Comments:

Container Codes:

AG1H	1 L amber glass HCL	BP1N	1 L plastic HNO3	DG9C	40 mL vial with ascorbic acid	VG9B	40 mL clear VOA vial Na Bisulfate
AG1S	1 L amber glass H2SO4	BP1S	1 L plastic H2SO4	DG9T	40 mL amber VOA vial Na Thio	VG9H	40 mL clear VOA vial HCl
AG1T	1 L amber glass Na Thiosulfate	BP1U	1 L plastic unpreserved	DG9U	40 mL amber VOA vial	VG9M	40 mL clear VOA vial MeOH
AG2H	1 L amber glass unpreserved	BP1Z	1 L plastic NaOH, Zn Ac	DWC	Dry weight container	VG9S	40 mL clear VOA vial H2SO4
AG2N	500 mL amber glass HCl	BP2A	500 mL plastic NaOH	EZH	25 g Encore	VG9T	40 mL clear VOA vial Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2N	500 mL plastic HNO3	GJ	1 Gallon jug	VG9U	40 mL clear VOA vial
AG2U	500 mL amber unpreserved	BP2S	500 mL plastic H2SO4	GN	General unpreserved	VG9W	40 mL clear VOA vial DI Water/stir bar
AG3H	250 mL amber glass HCl	BP2U	500 mL plastic unpreserved	GNN	General preserved with Nitric Acid	VSG	Headspace septa vial and HCl
AG3S	250 mL amber glass H2SO4	BP2Z	500 mL NaOH, Zn Ac	GNS	General with H2SO4	WGFY	4 oz wide jar and wipe Hexane
AG3U	250 mL amber glass unpreserved	BP3A	250 mL plastic NaOH, Asc Acid	JGCU	8 oz clear wide jar	WPDU	16 oz clear wide mouth jar
AG4S	120 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	JGFM	4 oz amber wide jar MeOH	XAD	XAD trap
AG4U	125 mL amber glass unpreserved	BP3S	250 mL plastic H2SO4	JGFU	4 oz wide jar		
B1FM	4 oz clear jar MeOH	BP3U	250 mL plastic unpreserved	PB	Clear zip-lock bag		
B1TU	2 oz clear MeOH	BP3Z	250 mL plastic NaOH, Zn Ac	PUF	Polyurethane Foam		
B1U	2 oz clear MeOH	BP4N	125 mL plastic HNO3	SP5T	120 mL Coliform NA Thiosulfate		
BP1A	1 L plastic NaOH	BP4U	125 mL plastic unpreserved	T	Tedlar Bag		
		C	Air Cassettes	TDT	Thermal desorption tube		
		DG9H	40 mL amber VOA vial HCl	U	Summa Can		





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1519136

**Limits:** Historical/Performance

**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep

**Batch:** IIPX/17128 (HBN: 152057)

**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC

**Batch:** IICP/11175 (HBN: 152275)

**Analyzed By:** Peter P. Steen

## Blank

**LRB:** 455894

**Analyzed:** 07/14/2015 13:43

**Units:** ug/sample

Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

**LMB:** 455895

**Analyzed:** 07/14/2015 13:47

**Units:** ug/sample

Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

**LCS:** 455896

**Analyzed:** 07/14/2015 14:05

**Dilution:** 1

**Units:** ug/sample

**LCSD:** 455897

**Analyzed:** 07/14/2015 14:08

**Dilution:** 1

**Units:** ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Lead	101	100	101	88.0 115.0	103	103	1.27	0.0 15.0

## QC Data Approved and Reviewed by

Peter P. Steen

Analyst

Neil A. Edwards

Peer Review

7/14/2015

Date

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: July 14, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1519136**

Client Project ID: Sierra Zinc 071015

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-7082015</b>		Collected: 07/08/2015		
Lab ID: 1519136001	Sampling Location: Sierra Zinc		Received: 07/10/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 07/13/2015	
		Sampling Parameter: Air Volume 2140 L	Analyzed: 07/14/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00018	0.38	1.3

Sample ID: <b>SZ-AR-2-7082015</b>		Collected: 07/08/2015		
Lab ID: 1519136002	Sampling Location: Sierra Zinc		Received: 07/10/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 07/13/2015	
		Sampling Parameter: Air Volume 2136 L	Analyzed: 07/14/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00018	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Peter P. Steen 07/14/2015 16:07	/S/ Neil A. Edwards 07/14/2015 17:07

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: als@alst.com  
Web: www.alssl.com

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company

Environmental

[www.alsglobal.com](http://www.alsglobal.com)

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# ANALYTICAL REPORT

Workorder: **34-1519136**

Client Project ID: Sierra Zinc 071015

Purchase Order: Sierra Zinc

Project Manager: Kevin Griffiths

## General Lab Comments

The results provided in this report relate only to the items tested.  
Samples were received in acceptable condition unless otherwise noted.  
Samples have not been blank corrected unless otherwise noted.  
This test report shall not be reproduced, except in full, without written approval of ALS.

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All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACCLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1519817

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, MCE Prep  
**Batch:** IIPX/17178 (HBN: 152540)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11201 (HBN: 152638)  
**Analyzed By:** Lauren Jones

## Blank

<b>LRB:</b> 457206 <b>Analyzed:</b> 07/20/2015 16:09  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 457207 <b>Analyzed:</b> 07/20/2015 16:13  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 457208 <b>Analyzed:</b> 07/20/2015 16:18 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 457209 <b>Analyzed:</b> 07/20/2015 16:22 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	107	100	107	88.0 115.0	103	103	3.69	0.0 15.0	

## Comments

The LMB 457315 is above the reporting limit at 3.85 ug/sample. The corresponding LCS 457316 and LCSD 457317 have been media blank corrected.

## QC Data Approved and Reviewed by

<u>Lauren Jones</u>	<u>Penny A. Foote</u>	<u>7/21/2015</u>
Analyst	Peer Review	Date

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
  - ▲ - Sample result is greater than 4 times the spike added
  - - Sample and Matrix Duplicate less than 5 times the reporting limit
- RPD - Relative % Difference (Spike / Spike Duplicate)  
 ND - Not Detected (U - Qualifier also flags analyte as not detected)  
 NA - Not Applicable  
 QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: July 21, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626

E-mail: lyndsey@rmc-ut.com

Workorder: **34-1519817**

Client Project ID: Sierra Zinc 071515  
Purchase Order: NA  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-7152015</b>		Collected: 07/15/2015		
Lab ID: 1519817001	Sampling Location: Sierra Zinc		Received: 07/17/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 07/20/2015	
		Sampling Parameter: Air Volume 2520 L	Analyzed: 07/20/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-2-7152015</b>		Collected: 07/15/2015		
Lab ID: 1519817002	Sampling Location: Sierra Zinc		Received: 07/17/2015	
Method: NIOSH 7300 Mod.		Media: MCE Filter	Prepared: 07/20/2015	
		Sampling Parameter: Air Volume 2536 L	Analyzed: 07/20/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

## Comments

### Quality Control: NIOSH 7300 Mod. - (HBN: 152638)

The LMB 457315 is above the reporting limit at 3.85 ug/sample. The corresponding LCS 457316 and LCSD 457317 have been media blank corrected.

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Lauren Jones 07/21/2015 09:07	/S/ Penny A. Foote 07/21/2015 13:07

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: als@alst.com  
Web: www.alssl.com

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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# ANALYTICAL REPORT

Workorder: **34-1519817**

Client Project ID: Sierra Zinc 071515

Purchase Order: NA

Project Manager: Kevin Griffiths

## General Lab Comments

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Samples were received in acceptable condition unless otherwise noted.  
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	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	AClass (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	AClass (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

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LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

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( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.



July 27, 2015

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

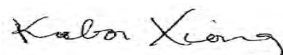
RE: Project: Weekly Lagoon 8A  
Pace Project No.: 10314658

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on July 15, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim, Resource Management Consultants



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10314658001	SZ-SW-ADIT-7132015	Water	07/13/15 07:15	07/15/15 09:50
10314658002	SZ-SW-ADIT-05-7132015	Water	07/13/15 07:15	07/15/15 09:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10314658001	SZ-SW-ADIT-7132015	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	22	PASI-M
		EPA 245.1	JDD	1	PASI-M
		EPA 245.1	LMW	1	PASI-M
10314658002	SZ-SW-ADIT-05-7132015	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	22	PASI-M
		EPA 245.1	JDD	1	PASI-M
		EPA 245.1	LMW	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Weekly Lagoon 8A  
Pace Project No.: 10314658

**Sample: SZ-SW-ADIT-7132015**      **Lab ID: 10314658001**      Collected: 07/13/15 07:15      Received: 07/15/15 09:50      Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8								
Aluminum	ND	ug/L	10.0	1	07/21/15 06:23	07/22/15 17:36	7429-90-5	
Antimony	ND	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7440-36-0	
Arsenic	ND	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7440-38-2	
Barium	28.3	ug/L	0.30	1	07/21/15 06:23	07/22/15 17:36	7440-39-3	
Beryllium	ND	ug/L	0.20	1	07/21/15 06:23	07/22/15 17:36	7440-41-7	
Cadmium	3.9	ug/L	0.080	1	07/21/15 06:23	07/22/15 17:36	7440-43-9	
Calcium	74700	ug/L	800	20	07/21/15 06:23	07/22/15 17:39	7440-70-2	
Chromium	ND	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7440-47-3	
Cobalt	ND	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7440-48-4	
Copper	1.2	ug/L	1.0	1	07/21/15 06:23	07/22/15 17:36	7440-50-8	
Iron	ND	ug/L	50.0	1	07/21/15 06:23	07/22/15 17:36	7439-89-6	
Lead	6.4	ug/L	0.10	1	07/21/15 06:23	07/22/15 17:36	7439-92-1	
Magnesium	34600	ug/L	200	20	07/21/15 06:23	07/22/15 17:39	7439-95-4	
Manganese	2.5	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7439-96-5	
Nickel	ND	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7440-02-0	
Potassium	3550	ug/L	50.0	1	07/21/15 06:23	07/22/15 17:36	7440-09-7	
Selenium	ND	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7782-49-2	
Silver	ND	ug/L	0.50	1	07/21/15 06:23	07/22/15 17:36	7440-22-4	
Sodium	8770	ug/L	50.0	1	07/21/15 06:23	07/22/15 17:36	7440-23-5	
Thallium	ND	ug/L	0.10	1	07/21/15 06:23	07/22/15 17:36	7440-28-0	
Vanadium	ND	ug/L	1.0	1	07/21/15 06:23	07/22/15 17:36	7440-62-2	
Zinc	473	ug/L	100	20	07/21/15 06:23	07/22/15 17:39	7440-66-6	

<b>200.8 MET ICPMS, Lab Filtered</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8								
Aluminum, Dissolved	ND	ug/L	10.0	1	07/20/15 08:34	07/20/15 12:34	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7440-38-2	
Barium, Dissolved	28.6	ug/L	0.30	1	07/20/15 08:34	07/20/15 12:34	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	07/20/15 08:34	07/20/15 12:34	7440-41-7	
Cadmium, Dissolved	3.9	ug/L	0.080	1	07/20/15 08:34	07/20/15 12:34	7440-43-9	
Calcium, Dissolved	62300	ug/L	400	10	07/20/15 08:34	07/20/15 13:11	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	07/20/15 08:34	07/20/15 12:34	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	07/20/15 08:34	07/20/15 12:34	7439-89-6	
Lead, Dissolved	6.1	ug/L	0.10	1	07/20/15 08:34	07/20/15 12:34	7439-92-1	
Magnesium, Dissolved	30100	ug/L	100	10	07/20/15 08:34	07/20/15 13:11	7439-95-4	
Manganese, Dissolved	1.6	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7440-02-0	
Potassium, Dissolved	3630	ug/L	50.0	1	07/20/15 08:34	07/20/15 12:34	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:34	7440-22-4	
Sodium, Dissolved	8730	ug/L	50.0	1	07/20/15 08:34	07/20/15 12:34	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	07/20/15 08:34	07/20/15 12:34	7440-28-0	
Vanadium, Dissolved	ND	ug/L	1.0	1	07/20/15 08:34	07/20/15 12:34	7440-62-2	
Zinc, Dissolved	423	ug/L	50.0	10	07/20/15 08:34	07/20/15 13:11	7440-66-6	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

Sample: SZ-SW-ADIT-7132015		Lab ID: 10314658001	Collected: 07/13/15 07:15	Received: 07/15/15 09:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>245.1 Mercury</b> Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	ND	ug/L	0.20	1	07/21/15 02:40	07/21/15 17:38	7439-97-6	
<b>245.1 Mercury LL, Lab Filtered</b> Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.010	1	07/23/15 00:00	07/27/15 15:21	7439-97-6	

Sample: SZ-SW-ADIT-05-7132015		Lab ID: 10314658002	Collected: 07/13/15 07:15	Received: 07/15/15 09:50	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Aluminum	ND	ug/L	10.0	1	07/21/15 06:23	07/23/15 09:36	7429-90-5	
Antimony	ND	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7440-36-0	
Arsenic	ND	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7440-38-2	
Barium	29.6	ug/L	0.30	1	07/21/15 06:23	07/23/15 09:36	7440-39-3	
Beryllium	ND	ug/L	0.20	1	07/21/15 06:23	07/23/15 09:36	7440-41-7	
Cadmium	4.1	ug/L	0.080	1	07/21/15 06:23	07/23/15 09:36	7440-43-9	
Calcium	74100	ug/L	800	20	07/21/15 06:23	07/22/15 17:53	7440-70-2	M1
Chromium	ND	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7440-47-3	
Cobalt	ND	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7440-48-4	
Copper	1.2	ug/L	1.0	1	07/21/15 06:23	07/23/15 09:36	7440-50-8	
Iron	ND	ug/L	50.0	1	07/21/15 06:23	07/23/15 09:36	7439-89-6	
Lead	6.7	ug/L	0.10	1	07/21/15 06:23	07/23/15 09:36	7439-92-1	
Magnesium	34600	ug/L	200	20	07/21/15 06:23	07/22/15 17:53	7439-95-4	
Manganese	2.1	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7439-96-5	
Nickel	ND	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7440-02-0	
Potassium	3720	ug/L	50.0	1	07/21/15 06:23	07/23/15 09:36	7440-09-7	
Selenium	ND	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7782-49-2	
Silver	ND	ug/L	0.50	1	07/21/15 06:23	07/23/15 09:36	7440-22-4	
Sodium	9600	ug/L	50.0	1	07/21/15 06:23	07/23/15 09:36	7440-23-5	M1
Thallium	ND	ug/L	0.10	1	07/21/15 06:23	07/23/15 09:36	7440-28-0	
Vanadium	ND	ug/L	1.0	1	07/21/15 06:23	07/23/15 09:36	7440-62-2	
Zinc	475	ug/L	100	20	07/21/15 06:23	07/22/15 17:53	7440-66-6	

200.8 MET ICPMS, Lab Filtered		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum, Dissolved	ND	ug/L	10.0	1	07/20/15 08:34	07/20/15 12:37	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7440-36-0	
Arsenic, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7440-38-2	
Barium, Dissolved	28.0	ug/L	0.30	1	07/20/15 08:34	07/20/15 12:37	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	07/20/15 08:34	07/20/15 12:37	7440-41-7	
Cadmium, Dissolved	3.8	ug/L	0.080	1	07/20/15 08:34	07/20/15 12:37	7440-43-9	
Calcium, Dissolved	58200	ug/L	400	10	07/20/15 08:34	07/20/15 13:14	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	07/20/15 08:34	07/20/15 12:37	7440-50-8	
Iron, Dissolved	66.3	ug/L	50.0	1	07/20/15 08:34	07/20/15 12:37	7439-89-6	

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## ANALYTICAL RESULTS

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

Sample: <b>SZ-SW-ADIT-05-7132015</b>	Lab ID: <b>10314658002</b>	Collected: 07/13/15 07:15	Received: 07/15/15 09:50	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS, Lab Filtered</b>								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Lead, Dissolved	<b>5.8</b>	ug/L	0.10	1	07/20/15 08:34	07/20/15 12:37	7439-92-1	
Magnesium, Dissolved	<b>28100</b>	ug/L	100	10	07/20/15 08:34	07/20/15 13:14	7439-95-4	
Manganese, Dissolved	<b>1.6</b>	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7440-02-0	
Potassium, Dissolved	<b>3550</b>	ug/L	50.0	1	07/20/15 08:34	07/20/15 12:37	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	07/20/15 08:34	07/20/15 12:37	7440-22-4	
Sodium, Dissolved	<b>8590</b>	ug/L	50.0	1	07/20/15 08:34	07/20/15 12:37	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	07/20/15 08:34	07/20/15 12:37	7440-28-0	
Vanadium, Dissolved	ND	ug/L	1.0	1	07/20/15 08:34	07/20/15 12:37	7440-62-2	
Zinc, Dissolved	<b>396</b>	ug/L	50.0	10	07/20/15 08:34	07/20/15 13:14	7440-66-6	
<b>245.1 Mercury</b>								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	ND	ug/L	0.20	1	07/21/15 02:40	07/21/15 17:45	7439-97-6	
<b>245.1 Mercury LL, Lab Filtered</b>								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.010	1	07/23/15 00:00	07/27/15 15:24	7439-97-6	

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### QUALITY CONTROL DATA

Project: Weekly Lagoon 8A  
Pace Project No.: 10314658

QC Batch: MERP/14259      Analysis Method: EPA 245.1  
QC Batch Method: EPA 245.1      Analysis Description: 245.1 Mercury  
Associated Lab Samples: 10314658001, 10314658002

METHOD BLANK: 2027660      Matrix: Water  
Associated Lab Samples: 10314658001, 10314658002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/21/15 17:29	

LABORATORY CONTROL SAMPLE: 2027661

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.4	109	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027662      2027663

Parameter	Units	10314658001		2027662		2027663		% Rec Limits	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				MSD % Rec
Mercury	ug/L	ND	5	5	5.6	5.4	111	109	70-130	2	20

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### QUALITY CONTROL DATA

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

QC Batch: MERP/14257

Analysis Method: EPA 245.1

QC Batch Method: EPA 245.1

Analysis Description: 245.1 Mercury - Dissolved, LL

Associated Lab Samples: 10314658001, 10314658002

METHOD BLANK: 2027620

Matrix: Water

Associated Lab Samples: 10314658001, 10314658002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.010	07/27/15 15:14	

LABORATORY CONTROL SAMPLE: 2027621

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	.25	0.25	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027622 2027623

Parameter	Units	2027622		2027623		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		10314703002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Mercury, Dissolved	ug/L	ND	.25	.25	0.26	0.25	104	101	70-130	2	20

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### QUALITY CONTROL DATA

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

QC Batch: MPRP/56245

Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8

Analysis Description: 200.8 MET

Associated Lab Samples: 10314658001, 10314658002

METHOD BLANK: 2027695

Matrix: Water

Associated Lab Samples: 10314658001, 10314658002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	10.0	07/23/15 09:50	
Antimony	ug/L	ND	0.50	07/23/15 09:50	
Arsenic	ug/L	ND	0.50	07/23/15 09:50	
Barium	ug/L	ND	0.30	07/23/15 09:50	
Beryllium	ug/L	ND	0.20	07/23/15 09:50	
Cadmium	ug/L	ND	0.080	07/23/15 09:50	
Calcium	ug/L	ND	40.0	07/23/15 09:50	
Chromium	ug/L	ND	0.50	07/23/15 09:50	
Cobalt	ug/L	ND	0.50	07/23/15 09:50	
Copper	ug/L	ND	1.0	07/23/15 09:50	
Iron	ug/L	ND	50.0	07/23/15 09:50	
Lead	ug/L	ND	0.10	07/23/15 09:50	
Magnesium	ug/L	ND	10.0	07/23/15 09:50	
Manganese	ug/L	ND	0.50	07/23/15 09:50	
Nickel	ug/L	ND	0.50	07/23/15 09:50	
Potassium	ug/L	ND	50.0	07/23/15 09:50	
Selenium	ug/L	ND	0.50	07/23/15 09:50	
Silver	ug/L	ND	0.50	07/23/15 09:50	
Sodium	ug/L	ND	50.0	07/23/15 09:50	
Thallium	ug/L	ND	0.10	07/23/15 09:50	
Vanadium	ug/L	ND	1.0	07/23/15 09:50	
Zinc	ug/L	ND	5.0	07/23/15 09:50	

LABORATORY CONTROL SAMPLE: 2027696

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	80	87.8	110	85-115	
Antimony	ug/L	80	82.3	103	85-115	
Arsenic	ug/L	80	83.4	104	85-115	
Barium	ug/L	80	81.4	102	85-115	
Beryllium	ug/L	80	81.5	102	85-115	
Cadmium	ug/L	80	82.6	103	85-115	
Calcium	ug/L	1000	1030	103	85-115	
Chromium	ug/L	80	85.7	107	85-115	
Cobalt	ug/L	80	82.1	103	85-115	
Copper	ug/L	80	82.8	104	85-115	
Iron	ug/L	1000	1090	109	85-115	
Lead	ug/L	80	81.1	101	85-115	
Magnesium	ug/L	1000	1080	108	85-115	
Manganese	ug/L	80	85.8	107	85-115	

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### QUALITY CONTROL DATA

Project: Weekly Lagoon 8A  
Pace Project No.: 10314658

LABORATORY CONTROL SAMPLE: 2027696

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	ug/L	80	82.6	103	85-115	
Potassium	ug/L	1000	1070	107	85-115	
Selenium	ug/L	80	82.4	103	85-115	
Silver	ug/L	80	86.2	108	85-115	
Sodium	ug/L	1000	1090	109	85-115	
Thallium	ug/L	80	84.8	106	85-115	
Vanadium	ug/L	80	84.2	105	85-115	
Zinc	ug/L	80	87.0	109	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2027710 2027711

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10314658002 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum	ug/L	ND	80	80	92.7	94.1	107	109	70-130	1	20	
Antimony	ug/L	ND	80	80	83.2	84.6	104	105	70-130	2	20	
Arsenic	ug/L	ND	80	80	83.1	84.2	103	105	70-130	1	20	
Barium	ug/L	29.6	80	80	109	110	99	101	70-130	1	20	
Beryllium	ug/L	ND	80	80	80.1	79.8	100	100	70-130	0	20	
Cadmium	ug/L	4.1	80	80	85.8	88.3	102	105	70-130	3	20	
Calcium	ug/L	74100	1000	1000	75100	75700	104	159	70-130	1	20	M1
Chromium	ug/L	ND	80	80	84.4	86.0	105	107	70-130	2	20	
Cobalt	ug/L	ND	80	80	79.2	80.8	99	101	70-130	2	20	
Copper	ug/L	1.2	80	80	80.5	81.9	99	101	70-130	2	20	
Iron	ug/L	ND	1000	1000	1070	1090	106	108	70-130	2	20	
Lead	ug/L	6.7	80	80	84.2	85.5	97	99	70-130	1	20	
Magnesium	ug/L	34600	1000	1000	35300	35500	71	87	70-130	0	20	
Manganese	ug/L	2.1	80	80	85.4	87.1	104	106	70-130	2	20	
Nickel	ug/L	ND	80	80	78.6	80.2	98	100	70-130	2	20	
Potassium	ug/L	3720	1000	1000	4520	4560	80	84	70-130	1	20	
Selenium	ug/L	ND	80	80	81.3	82.1	101	102	70-130	1	20	
Silver	ug/L	ND	80	80	84.3	85.6	105	107	70-130	2	20	
Sodium	ug/L	9600	1000	1000	9900	9930	30	33	70-130	0	20	M1
Thallium	ug/L	ND	80	80	83.4	83.8	104	105	70-130	0	20	
Vanadium	ug/L	ND	80	80	85.3	86.9	106	108	70-130	2	20	
Zinc	ug/L	475	80	80	561	560	107	107	70-130	0	20	

MATRIX SPIKE SAMPLE: 2027712

Parameter	Units	10314940003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	259	80	474	270	70-130	M1
Antimony	ug/L	0.28J	80	82.7	103	70-130	
Arsenic	ug/L	0.60	80	83.8	104	70-130	
Barium	ug/L	28.5	80	111	103	70-130	
Beryllium	ug/L	ND	80	81.5	102	70-130	

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### QUALITY CONTROL DATA

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

MATRIX SPIKE SAMPLE:		2027712					
Parameter	Units	10314940003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium	ug/L	0.027J	80	82.1	103	70-130	
Calcium	ug/L	19800	1000	21200	136	70-130	M1
Chromium	ug/L	1.4	80	87.3	107	70-130	
Cobalt	ug/L	0.23J	80	82.5	103	70-130	
Copper	ug/L	3.5	80	85.8	103	70-130	
Iron	ug/L	441	1000	1610	116	70-130	
Lead	ug/L	0.48	80	78.5	97	70-130	
Magnesium	ug/L	3780	1000	4890	111	70-130	
Manganese	ug/L	79.3	80	167	110	70-130	
Nickel	ug/L	1.2	80	83.3	103	70-130	
Potassium	ug/L	1250	1000	2400	115	70-130	
Selenium	ug/L	ND	80	80.8	101	70-130	
Silver	ug/L	ND	80	84.7	106	70-130	
Sodium	ug/L	68000	1000	76000	803	70-130	M1
Thallium	ug/L	ND	80	82.8	103	70-130	
Vanadium	ug/L	2.3	80	88.9	108	70-130	
Zinc	ug/L	21.9	80	110	110	70-130	

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### QUALITY CONTROL DATA

Project: Weekly Lagoon 8A  
Pace Project No.: 10314658

QC Batch: MPRP/56204 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved  
Associated Lab Samples: 10314658001, 10314658002

METHOD BLANK: 2026739 Matrix: Water  
Associated Lab Samples: 10314658001, 10314658002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	10.0	07/20/15 12:22	
Antimony, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Arsenic, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Barium, Dissolved	ug/L	ND	0.30	07/20/15 12:22	
Beryllium, Dissolved	ug/L	ND	0.20	07/20/15 12:22	
Cadmium, Dissolved	ug/L	ND	0.080	07/20/15 12:22	
Calcium, Dissolved	ug/L	ND	40.0	07/20/15 12:22	
Chromium, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Cobalt, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Copper, Dissolved	ug/L	ND	1.0	07/20/15 12:22	
Iron, Dissolved	ug/L	ND	50.0	07/20/15 12:22	
Lead, Dissolved	ug/L	ND	0.10	07/20/15 12:22	
Magnesium, Dissolved	ug/L	ND	10.0	07/20/15 12:22	
Manganese, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Nickel, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Potassium, Dissolved	ug/L	ND	50.0	07/20/15 12:22	
Selenium, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Silver, Dissolved	ug/L	ND	0.50	07/20/15 12:22	
Sodium, Dissolved	ug/L	ND	50.0	07/20/15 12:22	
Thallium, Dissolved	ug/L	ND	0.10	07/20/15 12:22	
Vanadium, Dissolved	ug/L	ND	1.0	07/20/15 12:22	
Zinc, Dissolved	ug/L	ND	5.0	07/20/15 12:22	

LABORATORY CONTROL SAMPLE: 2026740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	80	91.5	114	85-115	
Antimony, Dissolved	ug/L	80	85.0	106	85-115	
Arsenic, Dissolved	ug/L	80	85.4	107	85-115	
Barium, Dissolved	ug/L	80	90.0	112	85-115	
Beryllium, Dissolved	ug/L	80	83.7	105	85-115	
Cadmium, Dissolved	ug/L	80	87.8	110	85-115	
Calcium, Dissolved	ug/L	1000	1110	111	85-115	
Chromium, Dissolved	ug/L	80	91.0	114	85-115	
Cobalt, Dissolved	ug/L	80	91.7	115	85-115	
Copper, Dissolved	ug/L	80	88.6	111	85-115	
Iron, Dissolved	ug/L	1000	1130	113	85-115	
Lead, Dissolved	ug/L	80	89.2	112	85-115	
Magnesium, Dissolved	ug/L	1000	1110	111	85-115	
Manganese, Dissolved	ug/L	80	88.6	111	85-115	

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### QUALITY CONTROL DATA

Project: Weekly Lagoon 8A  
Pace Project No.: 10314658

LABORATORY CONTROL SAMPLE: 2026740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	80	89.7	112	85-115	
Potassium, Dissolved	ug/L	1000	1140	114	85-115	
Selenium, Dissolved	ug/L	80	83.0	104	85-115	
Silver, Dissolved	ug/L	80	81.5	102	85-115	
Sodium, Dissolved	ug/L	1000	1130	113	85-115	
Thallium, Dissolved	ug/L	80	91.9	115	85-115	
Vanadium, Dissolved	ug/L	80	89.2	112	85-115	
Zinc, Dissolved	ug/L	80	91.5	114	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2026741 2026742

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10314063001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum, Dissolved	ug/L	34.3	80	80	131	124	121	112	70-130	6	20	
Antimony, Dissolved	ug/L	ND	80	80	85.7	81.2	107	101	70-130	5	20	
Arsenic, Dissolved	ug/L	ND	80	80	89.5	84.7	112	106	70-130	6	20	
Barium, Dissolved	ug/L	17.3	80	80	108	102	113	105	70-130	6	20	
Beryllium, Dissolved	ug/L	ND	80	80	93.1	87.2	116	109	70-130	7	20	
Cadmium, Dissolved	ug/L	ND	80	80	85.7	82.6	107	103	70-130	4	20	
Calcium, Dissolved	ug/L	186000	1000	1000	197000	186000	1080	1	70-130	6	20	E,M1
Chromium, Dissolved	ug/L	ND	80	80	94.0	88.7	117	111	70-130	6	20	
Cobalt, Dissolved	ug/L	8.8	80	80	103	96.7	117	110	70-130	6	20	
Copper, Dissolved	ug/L	ND	80	80	89.2	84.2	110	104	70-130	6	20	
Iron, Dissolved	ug/L	ND	1000	1000	1190	1120	116	109	70-130	6	20	
Lead, Dissolved	ug/L	ND	80	80	85.8	81.6	107	102	70-130	5	20	
Magnesium, Dissolved	ug/L	209000	1000	1000	223000	212000	1370	285	70-130	5	20	E,M1
Manganese, Dissolved	ug/L	12.9	80	80	104	98.9	114	108	70-130	5	20	
Nickel, Dissolved	ug/L	25.1	80	80	118	110	116	106	70-130	7	20	
Potassium, Dissolved	ug/L	11400	1000	1000	13600	12600	218	122	70-130	7	20	M1
Selenium, Dissolved	ug/L	2.4	80	80	97.0	89.8	118	109	70-130	8	20	
Silver, Dissolved	ug/L	ND	80	80	74.0	70.2	93	88	70-130	5	20	
Sodium, Dissolved	ug/L	323000	1000	1000	342000	322000	1870	-42	70-130	6	20	E,M1
Thallium, Dissolved	ug/L	ND	80	80	79.3	76.1	99	95	70-130	4	20	
Vanadium, Dissolved	ug/L	ND	80	80	97.4	92.4	121	115	70-130	5	20	
Zinc, Dissolved	ug/L	ND	80	80	93.4	89.4	113	108	70-130	4	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc..



## QUALIFIERS

Project: Weekly Lagoon 8A  
Pace Project No.: 10314658

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Weekly Lagoon 8A

Pace Project No.: 10314658

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10314658001	SZ-SW-ADIT-7132015	EPA 200.8	MPRP/56245	EPA 200.8	ICPM/25475
10314658002	SZ-SW-ADIT-05-7132015	EPA 200.8	MPRP/56245	EPA 200.8	ICPM/25475
10314658001	SZ-SW-ADIT-7132015	EPA 200.8	MPRP/56204	EPA 200.8	ICPM/25446
10314658002	SZ-SW-ADIT-05-7132015	EPA 200.8	MPRP/56204	EPA 200.8	ICPM/25446
10314658001	SZ-SW-ADIT-7132015	EPA 245.1	MERP/14259	EPA 245.1	MERC/16632
10314658002	SZ-SW-ADIT-05-7132015	EPA 245.1	MERP/14259	EPA 245.1	MERC/16632
10314658001	SZ-SW-ADIT-7132015	EPA 245.1	MERP/14257	EPA 245.1	MERC/16655
10314658002	SZ-SW-ADIT-05-7132015	EPA 245.1	MERP/14257	EPA 245.1	MERC/16655

### REPORT OF LABORATORY ANALYSIS

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**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
pH, Temperature, Conductivity, Redox, Dissolved Oxygen, Flow	Field	NA	NA	Instream and/or Polyethylene	500 ml	NA	None	NA
<b>Metals Water - Total</b>								
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cd	EPA 200.8	0.032	0.08	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180



**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals Water- Dissolved</b>				Polyethylene	Bottle 2	6°C	See Note 5	180
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 2	6°C	See Note 5	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 2	6°C	See Note 5	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	See Note 5	180
Cd	EPA 200.8	0.032	0.08	Polyethylene	Bottle 1	6°C	See Note 5	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 2	6°C	See Note 5	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 2	6°C	See Note 5	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 2	6°C	See Note 5	180



**Sample Condition Upon Receipt**

**Client Name:** The Goldfield Corp. - Denise Diaz      **Project #:** \_\_\_\_\_

WO# : 10314658



10314658

**Courier:**       Fed Ex       UPS       USPS       Client  
 Commercial       Pace       SpeedDee       Other: \_\_\_\_\_  
**Tracking Number:** 8050 083426289

**Custody Seal on Cooler/Box Present?**     Yes     No      **Seals Intact?**     Yes     No      **Optional:**    Proj. Due Date:      Proj. Name:

**Packing Material:**     Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_      **Temp Blank?**     Yes     No

**Thermometer Used:**     B88A9130516413     B88A912167504     B88A0143310098      **Type of Ice:**     Wet     Blue     None     Samples on ice, cooling process has begun

**Cooler Temp Read (°C):** 14.9      **Cooler Temp Corrected (°C):** 15.0      **Biological Tissue Frozen?**     Yes     No     N/A  
 Temp should be above freezing to 6°C      **Correction Factor:** 10.1      **Date and Initials of Person Examining Contents:** CM 7/15/15

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?     Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?     Yes     No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
<b>Short Hold Time Analysis (&lt;72 hr)?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
<b>Rush Turn Around Time Requested?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1-2 / 1</u>
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____      Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**      **Field Data Required?**     Yes     No

Person Contacted: \_\_\_\_\_      Date/Time: \_\_\_\_\_

Comments/Resolution: \_\_\_\_\_

**Project Manager Review:** Kerby King      **Date:** July 17, 2015

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers).





# Quality Control Sample Batch Report

## Analysis Information

**Workorder:** 1520603

**Limits:** Historical/Performance  
**Basis:** ALS Laboratory Group

**Preparation:** IH Metals, PVC Prep  
**Batch:** IIPX/17246 (HBN: 153096)  
**Prepared By:** Lauren Jones

**Analysis:** IH Metals QC  
**Batch:** IICP/11233 (HBN: 153135)  
**Analyzed By:** Penny A. Foote

## Blank

<b>LRB:</b> 458668 <b>Analyzed:</b> 07/29/2015 11:46  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

<b>LMB:</b> 458669 <b>Analyzed:</b> 07/29/2015 11:49  <b>Units:</b> ug/sample			
Analyte	Result	MDL	RL
Lead	ND	0.375	1.25

## Laboratory Control Sample - Laboratory Control Sample Duplicate

<b>LCS:</b> 458670 <b>Analyzed:</b> 07/29/2015 11:52 <b>Dilution:</b> 1 <b>Units:</b> ug/sample					<b>LCSD:</b> 458671 <b>Analyzed:</b> 07/29/2015 11:56 <b>Dilution:</b> 1 <b>Units:</b> ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Lead	105	100	105	88.0 115.0	102	102	2.34	0.0 15.0	

## QC Data Approved and Reviewed by

<u>Penny A. Foote</u> <b>Analyst</b>	<u>Neil A. Edwards</u> <b>Peer Review</b>	<u>7/29/2015</u> <b>Date</b>
---	--	---------------------------------

## Symbols and Definitions

- \* - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable





# ANALYTICAL REPORT

Report Date: July 29, 2015

Lyndsey Fox  
Resource Environmental Management Consultant, Inc.  
8496 S Harrison Street  
Suite 102  
Midvale, UT 84047

Phone: (801) 255-2626  
Fax: (801) 255-3266  
E-mail: lyndsey@rmc-ut.com

Workorder: **34-1520603**  
Client Project ID: Sierra Zinc 072315  
Purchase Order: NA  
Project Manager: Kevin Griffiths

## Analytical Results

Sample ID: <b>SZ-AR-1-7232015</b>		Collected: 07/23/2015		
Lab ID: 1520603001	Sampling Location: Sierra Zinc		Received: 07/25/2015	
Method: NIOSH 7300 Mod.		Media: PVC Filter	Prepared: 07/29/2015	
		Sampling Parameter: Air Volume 2560 L	Analyzed: 07/29/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00015	0.38	1.3

Sample ID: <b>SZ-AR-2-7232015</b>		Collected: 07/23/2015		
Lab ID: 1520603002	Sampling Location: Sierra Zinc		Received: 07/25/2015	
Method: NIOSH 7300 Mod.		Media: PVC Filter	Prepared: 07/29/2015	
		Sampling Parameter: Air Volume 2680 L	Analyzed: 07/29/2015	
Analyte	ug/sample	mg/m <sup>3</sup>	LOD (ug/sample)	RL (ug/sample)
Lead	<0.38	<0.00014	0.38	1.3

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 7300 Mod.	/S/ Penny A. Foote 07/29/2015 15:07	/S/ Neil A. Edwards 07/29/2015 17:07

## Laboratory Contact Information

ALS Environmental  
960 W LeVoy Drive  
Salt Lake City, Utah 84123

Phone: (801) 266-7700  
Email: als@alst.com  
Web: www.alssl.com

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company

Environmental

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER





# ANALYTICAL REPORT

Workorder: **34-1520603**

Client Project ID: Sierra Zinc 072315

Purchase Order: NA

Project Manager: Kevin Griffiths

## General Lab Comments

The results provided in this report relate only to the items tested.  
Samples were received in acceptable condition unless otherwise noted.  
Samples have not been blank corrected unless otherwise noted.  
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ACCLASS (DoD ELAP)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bsdwl/labservice.htm">http://ndep.nv.gov/bsdwl/labservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSDnew/">http://www.deq.state.ok.us/CSDnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx">http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx</a>
	Florida (TNI)	E871067	<a href="http://www.dep.state.fl.us/labs/bars/sas/qa/">http://www.dep.state.fl.us/labs/bars/sas/qa/</a>
	Texas (TNI)	T104704456-11-1	<a href="http://www.tceq.texas.gov/field/qa/lab_accred_certif.html">http://www.tceq.texas.gov/field/qa/lab_accred_certif.html</a>
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:			
CPSC	ACCLASS (ISO 17025, CPSC)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>
Soil, Dust, Paint ,Air	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACCLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

## Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

\*\* No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.



August 03, 2015

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

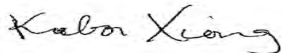
RE: Project: Sierra Zinc  
Pace Project No.: 10315108

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on July 21, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim, Resource Management Consultants



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Sierra Zinc

Pace Project No.: 10315108

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Virginia/VELAP Certification #: Pace

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: Sierra Zinc  
Pace Project No.: 10315108

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10315108001	SZ-MILL-Concrete-7152015	Solid	07/15/15 11:10	07/21/15 10:00

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### SAMPLE ANALYTE COUNT

Project: Sierra Zinc  
Pace Project No.: 10315108

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10315108001	SZ-MILL-Concrete-7152015	EPA 6020A	RJS	7	PASI-M
		EPA 7470A	LMW	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Sierra Zinc  
Pace Project No.: 10315108

**Sample: SZ-MILL-Concrete-7152015 Lab ID: 10315108001** Collected: 07/15/15 11:10 Received: 07/21/15 10:00 Matrix: Solid

**Results reported on a "wet-weight" basis**

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS, SPLP</b>		Analytical Method: EPA 6020A Preparation Method: EPA 3020 Leachate Method/Date: EPA 1312; 07/28/15 14:22 Initial pH: ; Final pH: 10.77						
Arsenic	ND	mg/L	0.0050	1	07/28/15 21:44	07/29/15 13:30	7440-38-2	
Barium	ND	mg/L	0.10	1	07/28/15 21:44	07/29/15 13:30	7440-39-3	
Cadmium	ND	mg/L	0.00080	1	07/28/15 21:44	07/29/15 13:30	7440-43-9	
Chromium	<b>0.022</b>	mg/L	0.0050	1	07/28/15 21:44	07/29/15 13:30	7440-47-3	
Lead	ND	mg/L	0.0010	1	07/28/15 21:44	07/29/15 13:30	7439-92-1	
Selenium	ND	mg/L	0.0050	1	07/28/15 21:44	07/29/15 13:30	7782-49-2	
Silver	ND	mg/L	0.0050	1	07/28/15 21:44	07/29/15 13:30	7440-22-4	
<b>7470A Mercury, SPLP</b>		Analytical Method: EPA 7470A Preparation Method: EPA 7470A Leachate Method/Date: EPA 1312; 07/28/15 14:22 Initial pH: ; Final pH: 10.77						
Mercury	ND	ug/L	0.60	1	07/28/15 23:05	07/29/15 17:59	7439-97-6	

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10315108

QC Batch: MERP/14320      Analysis Method: EPA 7470A  
QC Batch Method: EPA 7470A      Analysis Description: 7470A Mercury SPLP  
Associated Lab Samples: 10315108001

METHOD BLANK: 2034006      Matrix: Water  
Associated Lab Samples: 10315108001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.60	07/29/15 17:55	

METHOD BLANK: 2032739      Matrix: Solid  
Associated Lab Samples: 10315108001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.60	07/29/15 18:07	

LABORATORY CONTROL SAMPLE: 2034007

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034008      2034009

Parameter	Units	10315108001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	5.1	5.0	102	101	80-120	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Sierra Zinc  
Pace Project No.: 10315108

QC Batch: MPRP/56467      Analysis Method: EPA 6020A  
QC Batch Method: EPA 3020      Analysis Description: 6020A SPLP UPD4  
Associated Lab Samples: 10315108001

METHOD BLANK: 2034002      Matrix: Water  
Associated Lab Samples: 10315108001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.0050	07/29/15 12:47	
Barium	mg/L	ND	0.10	07/29/15 12:47	
Cadmium	mg/L	ND	0.00080	07/29/15 12:47	
Chromium	mg/L	ND	0.0050	07/29/15 12:47	
Lead	mg/L	ND	0.0010	07/29/15 12:47	
Selenium	mg/L	ND	0.0050	07/29/15 12:47	
Silver	mg/L	ND	0.0050	07/29/15 12:47	

METHOD BLANK: 2032739      Matrix: Solid  
Associated Lab Samples: 10315108001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.0050	07/29/15 13:16	
Barium	mg/L	ND	0.10	07/29/15 13:16	
Cadmium	mg/L	ND	0.00080	07/29/15 13:16	
Chromium	mg/L	ND	0.0050	07/29/15 13:16	
Lead	mg/L	ND	0.0010	07/29/15 13:16	
Selenium	mg/L	ND	0.0050	07/29/15 13:16	
Silver	mg/L	ND	0.0050	07/29/15 13:16	

LABORATORY CONTROL SAMPLE: 2034003

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	.08	0.081	101	80-120	
Barium	mg/L	.08	.082J	102	80-120	
Cadmium	mg/L	.08	0.081	101	80-120	
Chromium	mg/L	.08	0.082	103	80-120	
Lead	mg/L	.08	0.082	103	80-120	
Selenium	mg/L	.08	0.082	102	80-120	
Silver	mg/L	.08	0.082	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2034004      2034005

Parameter	Units	10315108001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.							
Arsenic	mg/L	ND	.08	.08	0.081	0.080	101	100	75-125	1	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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### QUALITY CONTROL DATA

Project: Sierra Zinc

Pace Project No.: 10315108

Parameter	Units	2034004		2034005		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		10315108001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Barium	mg/L	ND	.08	.08	.12J	.12J	101	99	75-125		20	
Cadmium	mg/L	ND	.08	.08	0.079	0.079	99	99	75-125	1	20	
Chromium	mg/L	0.022	.08	.08	0.10	0.10	100	101	75-125	0	20	
Lead	mg/L	ND	.08	.08	0.080	0.080	100	100	75-125	1	20	
Selenium	mg/L	ND	.08	.08	0.082	0.082	102	102	75-125	1	20	
Silver	mg/L	ND	.08	.08	0.080	0.080	99	99	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: Sierra Zinc

Pace Project No.: 10315108

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Sierra Zinc

Pace Project No.: 10315108

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10315108001	SZ-MILL-Concrete-7152015	EPA 3020	MPRP/56467	EPA 6020A	ICPM/25630
10315108001	SZ-MILL-Concrete-7152015	EPA 7470A	MERP/14320	EPA 7470A	MERC/16710


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	Document Name: <b>Sample Condition Upon Receipt Form</b>	Document Revised: 23Feb2015 Page 1 of 1
	Document No.: <b>F-MN-L-213-rev.13</b>	Issuing Authority: Pace Minnesota Quality Office

**Sample Condition Upon Receipt**

Client Name: RML

Project #: **WO# : 10315108**

Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeedDee  Other:  
 Tracking Number: 8050 0834 2617



Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date:      Proj. Name:  
 Packing Material:  Bubble Wrap  Bubble Bags  None  Other: PB      Temp Blank?  Yes  No  
 Thermometer Used:  888A9130516413  888A912167504  888A0143310098      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 21.6 Cooler Temp Corrected (°C): 21.3      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: -0.13      Date and Initials of Person Examining Contents: 7/21/15/AG

USDA Regulated Soil (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?  Yes  No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A -Includes Date/Time/ID/Analysis Matrix: <u>S2</u>	12. <u>no time on label</u>
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl Sample # Initial when completed:      Lot # of added preservative:
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Pace Trip Blank Lot # (if purchased):	15.

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

Field Data Required?  Yes  No

Project Manager Review: Karl Young      Date: July 22, 2015

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).





1700 Elm Street, Suite 200  
 Minneapolis, MN 55414  
 (612)607-1700

## SAMPLE ACKNOWLEDGMENT

**Samples Submitted By:** Resource Management Consultants  
**Client Project ID:** SIERRA ZINC  
**Client PO#:** RMCYQSM

**Pace Project Manager:** Kabor Xiong  
 Phone (612)607-1700  
 kabor.xiong@pacelabs.com

**Pace Analytical Project ID:** 10317959  
**Samples Received:** August 12, 2015 09:45 AM  
**Estimated Completion:** August 26, 2015

**CC:** Jim, Lyndsey Fox

Customer Sample ID	Pace Analytical Lab ID	Matrix	Date/Time Collected	Method
SZ-TS-07142015	10317959001	Solid	07/14/15 08:27	6020A ICPMS Metals Beryllium, Sodium, Magnesium, Aluminum, Potassium, Calcium, Vanadium, Chromium, Iron, Manganese, Cobalt, Nickel, Copper, Zinc, Arsenic, Selenium, Silver, Cadmium, Antimony, Barium, Thallium, Lead 7471B Mercury Dry Weight
SZ-EB-07202015	10317959002	Solid	07/20/15 09:13	6020A ICPMS Metals Beryllium, Sodium, Magnesium, Aluminum, Potassium, Calcium, Vanadium, Chromium, Iron, Manganese, Cobalt, Nickel, Copper, Zinc, Arsenic, Selenium, Silver, Cadmium, Antimony, Barium, Thallium, Lead 7471B Mercury Dry Weight
SZ-CS-07272015	10317959003	Solid	07/27/15 10:40	6020A ICPMS Metals Beryllium, Sodium, Magnesium, Aluminum, Potassium, Calcium, Vanadium, Chromium, Iron, Manganese, Cobalt, Nickel, Copper, Zinc, Arsenic, Selenium, Silver, Cadmium, Antimony, Barium, Thallium, Lead 7471B Mercury Dry Weight
SZ-SO-DU Z-9	10317959004	Solid	08/03/15 14:07	6020A ICPMS Metals Beryllium, Sodium, Magnesium, Aluminum, Potassium, Calcium, Vanadium, Chromium, Iron, Manganese, Cobalt, Nickel, Copper, Zinc, Arsenic, Selenium, Silver, Cadmium, Antimony, Barium, Thallium, Lead 7471B Mercury Dry Weight
SZ-SO-DU9-3	10317959005	Solid	08/05/15 13:22	6020A ICPMS Metals Beryllium, Sodium, Magnesium, Aluminum, Potassium, Calcium, Vanadium, Chromium, Iron, Manganese, Cobalt, Nickel, Copper, Zinc, Arsenic, Selenium, Silver, Cadmium, Antimony, Barium, Thallium, Lead 7471B Mercury Dry Weight
SZ-SO-DU9-8	10317959006	Solid	08/04/15 08:31	6020A ICPMS Metals Beryllium, Sodium, Magnesium, Aluminum, Potassium, Calcium, Vanadium, Chromium, Iron, Manganese, Cobalt, Nickel, Copper, Zinc, Arsenic, Selenium, Silver, Cadmium, Antimony, Barium, Thallium, Lead 7471B Mercury Dry Weight

Please contact your project manager if you recognize any discrepancy in this form or have any questions about your project.

Thank you for choosing Pace Analytical Services, Inc.





1700 Elm Street, Suite 200  
Minneapolis, MN 55414  
(612)607-1700

## SAMPLE ACKNOWLEDGMENT

Customer Sample ID	Pace Analytical Lab ID	Matrix	Date/Time Collected	Method
SZ-SO-DU9-22	10317959007	Solid	08/04/15 13:35	6020A ICPMS Metals Beryllium, Sodium, Magnesium, Aluminum, Potassium, Calcium, Vanadium, Chromium, Iron, Manganese, Cobalt, Nickel, Copper, Zinc, Arsenic, Selenium, Silver, Cadmium, Antimony, Barium, Thallium, Lead 7471B Mercury Dry Weight

Please contact your project manager if you recognize any discrepancy in this form or have any questions about your project.

Thank you for choosing Pace Analytical Services, Inc.



August 21, 2015

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

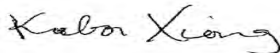
RE: Project: SIERRA ZINC  
Pace Project No.: 10317959

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on August 12, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim, Resource Management Consultants



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: SIERRA ZINC  
Pace Project No.: 10317959

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414  
A2LA Certification #: 2926.01  
Alaska Certification #: UST-078  
Alaska Certification #MN00064  
Alabama Certification #40770  
Arizona Certification #: AZ-0014  
Arkansas Certification #: 88-0680  
California Certification #: 01155CA  
Colorado Certification #Pace  
Connecticut Certification #: PH-0256  
EPA Region 8 Certification #: 8TMS-L  
Florida/NELAP Certification #: E87605  
Guam Certification #:14-008r  
Georgia Certification #: 959  
Georgia EPD #: Pace  
Idaho Certification #: MN00064  
Hawaii Certification #MN00064  
Illinois Certification #: 200011  
Indiana Certification#C-MN-01  
Iowa Certification #: 368  
Kansas Certification #: E-10167  
Kentucky Dept of Envi. Protection - DW #90062  
Kentucky Dept of Envi. Protection - WW #:90062  
Louisiana DEQ Certification #: 3086  
Louisiana DHH #: LA140001  
Maine Certification #: 2013011  
Maryland Certification #: 322  
Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137  
Mississippi Certification #: Pace  
Montana Certification #: MT0092  
Nevada Certification #: MN\_00064  
Nebraska Certification #: Pace  
New Jersey Certification #: MN-002  
New York Certification #: 11647  
North Carolina Certification #: 530  
North Carolina State Public Health #: 27700  
North Dakota Certification #: R-036  
Ohio EPA #: 4150  
Ohio VAP Certification #: CL101  
Oklahoma Certification #: 9507  
Oregon Certification #: MN200001  
Oregon Certification #: MN300001  
Pennsylvania Certification #: 68-00563  
Puerto Rico Certification  
Saipan (CNMI) #:MP0003  
South Carolina #:74003001  
Texas Certification #: T104704192  
Tennessee Certification #: 02818  
Utah Certification #: MN000642013-4  
Virginia DGS Certification #: 251  
Virginia/VELAP Certification #: Pace  
Washington Certification #: C486  
West Virginia Certification #: 382  
West Virginia DHHR #:9952C  
Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: SIERRA ZINC

Pace Project No.: 10317959

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10317959001	SZ-TS-07142015	Solid	07/14/15 08:27	08/12/15 09:45
10317959002	SZ-EB-07202015	Solid	07/20/15 09:13	08/12/15 09:45
10317959003	SZ-CS-07272015	Solid	07/27/15 10:40	08/12/15 09:45
10317959004	SZ-SO-DU Z-9	Solid	08/03/15 14:07	08/12/15 09:45
10317959005	SZ-SO-DU9-3	Solid	08/05/15 13:22	08/12/15 09:45
10317959006	SZ-SO-DU9-8	Solid	08/04/15 08:31	08/12/15 09:45
10317959007	SZ-SO-DU9-22	Solid	08/04/15 13:35	08/12/15 09:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: SIERRA ZINC

Pace Project No.: 10317959

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10317959001	SZ-TS-07142015	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10317959002	SZ-EB-07202015	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10317959003	SZ-CS-07272015	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10317959004	SZ-SO-DU Z-9	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10317959005	SZ-SO-DU9-3	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10317959006	SZ-SO-DU9-8	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
10317959007	SZ-SO-DU9-22	EPA 6020A	TT3	22	PASI-M
		EPA 7471B	DM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: SIERRA ZINC  
Pace Project No.: 10317959

**Sample: SZ-TS-07142015**      **Lab ID: 10317959001**      Collected: 07/14/15 08:27      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Aluminum	<b>11000</b>	mg/kg	10.7	20	08/14/15 10:26	08/14/15 15:15	7429-90-5	M6
Antimony	ND	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7440-36-0	M6
Arsenic	<b>5.5</b>	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7440-38-2	
Barium	<b>169</b>	mg/kg	0.32	20	08/14/15 10:26	08/14/15 15:15	7440-39-3	M6
Beryllium	<b>0.35</b>	mg/kg	0.21	20	08/14/15 10:26	08/14/15 15:15	7440-41-7	
Cadmium	<b>0.57</b>	mg/kg	0.086	20	08/14/15 10:26	08/14/15 15:15	7440-43-9	
Calcium	<b>41000</b>	mg/kg	214	100	08/14/15 10:26	08/20/15 18:31	7440-70-2	M6
Chromium	<b>19.0</b>	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7440-47-3	
Cobalt	<b>7.5</b>	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7440-48-4	
Copper	<b>21.8</b>	mg/kg	1.1	20	08/14/15 10:26	08/14/15 15:15	7440-50-8	
Iron	<b>18800</b>	mg/kg	53.5	20	08/14/15 10:26	08/14/15 15:15	7439-89-6	M6
Lead	<b>16.4</b>	mg/kg	0.11	20	08/14/15 10:26	08/14/15 15:15	7439-92-1	
Magnesium	<b>11700</b>	mg/kg	10.7	20	08/14/15 10:26	08/14/15 15:15	7439-95-4	M6
Manganese	<b>358</b>	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7439-96-5	M6
Nickel	<b>19.1</b>	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7440-02-0	
Potassium	<b>1850</b>	mg/kg	53.5	20	08/14/15 10:26	08/14/15 15:15	7440-09-7	M6
Selenium	ND	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7782-49-2	
Silver	ND	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:15	7440-22-4	
Sodium	<b>221</b>	mg/kg	53.5	20	08/14/15 10:26	08/14/15 15:15	7440-23-5	M6
Thallium	<b>0.13</b>	mg/kg	0.11	20	08/14/15 10:26	08/14/15 15:15	7440-28-0	
Vanadium	<b>38.6</b>	mg/kg	1.1	20	08/14/15 10:26	08/14/15 15:15	7440-62-2	M6
Zinc	<b>92.8</b>	mg/kg	5.4	20	08/14/15 10:26	08/14/15 15:15	7440-66-6	M6

<b>7471B Mercury</b>		Analytical Method: EPA 7471B    Preparation Method: EPA 7471B						
Mercury	ND	mg/kg	0.019	1	08/14/15 10:24	08/14/15 16:11	7439-97-6	H3

<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>7.5</b>	%	0.10	1		08/18/15 13:43		

**Sample: SZ-EB-07202015**      **Lab ID: 10317959002**      Collected: 07/20/15 09:13      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Aluminum	<b>19300</b>	mg/kg	9.5	20	08/14/15 10:26	08/14/15 15:00	7429-90-5	
Antimony	ND	mg/kg	0.48	20	08/14/15 10:26	08/14/15 15:00	7440-36-0	
Arsenic	<b>2.5</b>	mg/kg	0.48	20	08/14/15 10:26	08/14/15 15:00	7440-38-2	
Barium	<b>133</b>	mg/kg	0.29	20	08/14/15 10:26	08/14/15 15:00	7440-39-3	
Beryllium	<b>0.56</b>	mg/kg	0.19	20	08/14/15 10:26	08/14/15 15:00	7440-41-7	
Cadmium	<b>1.6</b>	mg/kg	0.076	20	08/14/15 10:26	08/14/15 15:00	7440-43-9	
Calcium	<b>7760</b>	mg/kg	38.2	20	08/14/15 10:26	08/14/15 15:00	7440-70-2	
Chromium	<b>19.0</b>	mg/kg	0.48	20	08/14/15 10:26	08/14/15 15:00	7440-47-3	
Cobalt	<b>14.6</b>	mg/kg	0.48	20	08/14/15 10:26	08/14/15 15:00	7440-48-4	

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## ANALYTICAL RESULTS

Project: SIERRA ZINC

Pace Project No.: 10317959

**Sample: SZ-EB-07202015**      **Lab ID: 10317959002**      Collected: 07/20/15 09:13      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Copper	18.6	mg/kg	0.95	20	08/14/15 10:26	08/14/15 15:00	7440-50-8	
Iron	28200	mg/kg	238	100	08/14/15 10:26	08/14/15 15:35	7439-89-6	
Lead	54.0	mg/kg	0.095	20	08/14/15 10:26	08/14/15 15:00	7439-92-1	
Magnesium	7400	mg/kg	9.5	20	08/14/15 10:26	08/14/15 15:00	7439-95-4	
Manganese	499	mg/kg	2.4	100	08/14/15 10:26	08/14/15 15:35	7439-96-5	
Nickel	15.9	mg/kg	0.48	20	08/14/15 10:26	08/14/15 15:00	7440-02-0	
Potassium	2630	mg/kg	47.7	20	08/14/15 10:26	08/14/15 15:00	7440-09-7	
Selenium	ND	mg/kg	0.48	20	08/14/15 10:26	08/14/15 15:00	7782-49-2	
Silver	ND	mg/kg	0.48	20	08/14/15 10:26	08/14/15 15:00	7440-22-4	
Sodium	174	mg/kg	47.7	20	08/14/15 10:26	08/14/15 15:00	7440-23-5	
Thallium	0.16	mg/kg	0.095	20	08/14/15 10:26	08/14/15 15:00	7440-28-0	
Vanadium	42.2	mg/kg	0.95	20	08/14/15 10:26	08/14/15 15:00	7440-62-2	
Zinc	361	mg/kg	4.8	20	08/14/15 10:26	08/14/15 15:00	7440-66-6	

**7471B Mercury**

Analytical Method: EPA 7471B    Preparation Method: EPA 7471B

Mercury	0.029	mg/kg	0.018	1	08/14/15 10:24	08/14/15 16:14	7439-97-6	
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**Dry Weight**

Analytical Method: ASTM D2974

Percent Moisture	1.1	%	0.10	1		08/18/15 13:43		
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**Sample: SZ-CS-07272015**      **Lab ID: 10317959003**      Collected: 07/27/15 10:40      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Aluminum	4580	mg/kg	10.8	20	08/14/15 10:26	08/14/15 15:03	7429-90-5	
Antimony	ND	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7440-36-0	
Arsenic	1.0	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7440-38-2	
Barium	32.9	mg/kg	0.32	20	08/14/15 10:26	08/14/15 15:03	7440-39-3	
Beryllium	ND	mg/kg	0.22	20	08/14/15 10:26	08/14/15 15:03	7440-41-7	
Cadmium	0.087	mg/kg	0.086	20	08/14/15 10:26	08/14/15 15:03	7440-43-9	
Calcium	1820	mg/kg	43.1	20	08/14/15 10:26	08/14/15 15:03	7440-70-2	
Chromium	3.9	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7440-47-3	
Cobalt	2.8	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7440-48-4	
Copper	4.5	mg/kg	1.1	20	08/14/15 10:26	08/14/15 15:03	7440-50-8	
Iron	7710	mg/kg	53.9	20	08/14/15 10:26	08/14/15 15:03	7439-89-6	
Lead	3.3	mg/kg	0.11	20	08/14/15 10:26	08/14/15 15:03	7439-92-1	
Magnesium	1690	mg/kg	10.8	20	08/14/15 10:26	08/14/15 15:03	7439-95-4	
Manganese	128	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7439-96-5	
Nickel	3.4	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7440-02-0	
Potassium	711	mg/kg	53.9	20	08/14/15 10:26	08/14/15 15:03	7440-09-7	
Selenium	ND	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7782-49-2	
Silver	ND	mg/kg	0.54	20	08/14/15 10:26	08/14/15 15:03	7440-22-4	

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### ANALYTICAL RESULTS

Project: SIERRA ZINC  
Pace Project No.: 10317959

**Sample: SZ-CS-07272015**      **Lab ID: 10317959003**      Collected: 07/27/15 10:40      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Sodium	<b>77.9</b>	mg/kg	53.9	20	08/14/15 10:26	08/14/15 15:03	7440-23-5	
Thallium	ND	mg/kg	0.11	20	08/14/15 10:26	08/14/15 15:03	7440-28-0	
Vanadium	<b>19.0</b>	mg/kg	1.1	20	08/14/15 10:26	08/14/15 15:03	7440-62-2	
Zinc	<b>19.4</b>	mg/kg	5.4	20	08/14/15 10:26	08/14/15 15:03	7440-66-6	
<b>7471B Mercury</b>		Analytical Method: EPA 7471B    Preparation Method: EPA 7471B						
Mercury	ND	mg/kg	0.021	1	08/14/15 10:24	08/14/15 16:16	7439-97-6	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>9.0</b>	%	0.10	1		08/18/15 13:43		

**Sample: SZ-SO-DU Z-9**      **Lab ID: 10317959004**      Collected: 08/03/15 14:07      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Aluminum	<b>5200</b>	mg/kg	9.9	20	08/14/15 10:26	08/14/15 15:06	7429-90-5	
Antimony	ND	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7440-36-0	
Arsenic	<b>1.6</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7440-38-2	
Barium	<b>36.2</b>	mg/kg	0.30	20	08/14/15 10:26	08/14/15 15:06	7440-39-3	
Beryllium	<b>0.22</b>	mg/kg	0.20	20	08/14/15 10:26	08/14/15 15:06	7440-41-7	
Cadmium	<b>0.29</b>	mg/kg	0.080	20	08/14/15 10:26	08/14/15 15:06	7440-43-9	
Calcium	<b>2930</b>	mg/kg	39.8	20	08/14/15 10:26	08/14/15 15:06	7440-70-2	
Chromium	<b>6.0</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7440-47-3	
Cobalt	<b>3.3</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7440-48-4	
Copper	<b>7.4</b>	mg/kg	0.99	20	08/14/15 10:26	08/14/15 15:06	7440-50-8	
Iron	<b>10200</b>	mg/kg	49.7	20	08/14/15 10:26	08/14/15 15:06	7439-89-6	
Lead	<b>45.0</b>	mg/kg	0.099	20	08/14/15 10:26	08/14/15 15:06	7439-92-1	
Magnesium	<b>2640</b>	mg/kg	9.9	20	08/14/15 10:26	08/14/15 15:06	7439-95-4	
Manganese	<b>168</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7439-96-5	
Nickel	<b>5.1</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7440-02-0	
Potassium	<b>816</b>	mg/kg	49.7	20	08/14/15 10:26	08/14/15 15:06	7440-09-7	
Selenium	ND	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7782-49-2	
Silver	ND	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:06	7440-22-4	
Sodium	<b>101</b>	mg/kg	49.7	20	08/14/15 10:26	08/14/15 15:06	7440-23-5	
Thallium	ND	mg/kg	0.099	20	08/14/15 10:26	08/14/15 15:06	7440-28-0	
Vanadium	<b>22.0</b>	mg/kg	0.99	20	08/14/15 10:26	08/14/15 15:06	7440-62-2	
Zinc	<b>70.5</b>	mg/kg	5.0	20	08/14/15 10:26	08/14/15 15:06	7440-66-6	
<b>7471B Mercury</b>		Analytical Method: EPA 7471B    Preparation Method: EPA 7471B						
Mercury	ND	mg/kg	0.018	1	08/14/15 10:24	08/14/15 16:19	7439-97-6	

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## ANALYTICAL RESULTS

Project: SIERRA ZINC

Pace Project No.: 10317959

**Sample: SZ-SO-DU Z-9**      **Lab ID: 10317959004**      Collected: 08/03/15 14:07      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>0.43</b>	%	0.10	1		08/18/15 13:44		

**Sample: SZ-SO-DU9-3**      **Lab ID: 10317959005**      Collected: 08/05/15 13:22      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A      Preparation Method: EPA 3050						
Aluminum	<b>10100</b>	mg/kg	11.0	20	08/14/15 10:26	08/14/15 15:09	7429-90-5	
Antimony	ND	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7440-36-0	
Arsenic	<b>1.7</b>	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7440-38-2	
Barium	<b>75.4</b>	mg/kg	0.33	20	08/14/15 10:26	08/14/15 15:09	7440-39-3	
Beryllium	<b>0.37</b>	mg/kg	0.22	20	08/14/15 10:26	08/14/15 15:09	7440-41-7	
Cadmium	<b>0.97</b>	mg/kg	0.088	20	08/14/15 10:26	08/14/15 15:09	7440-43-9	
Calcium	<b>6990</b>	mg/kg	43.8	20	08/14/15 10:26	08/14/15 15:09	7440-70-2	
Chromium	<b>7.9</b>	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7440-47-3	
Cobalt	<b>3.8</b>	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7440-48-4	
Copper	<b>10.7</b>	mg/kg	1.1	20	08/14/15 10:26	08/14/15 15:09	7440-50-8	
Iron	<b>11800</b>	mg/kg	54.8	20	08/14/15 10:26	08/14/15 15:09	7439-89-6	
Lead	<b>68.7</b>	mg/kg	0.11	20	08/14/15 10:26	08/14/15 15:09	7439-92-1	
Magnesium	<b>4510</b>	mg/kg	11.0	20	08/14/15 10:26	08/14/15 15:09	7439-95-4	
Manganese	<b>105</b>	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7439-96-5	
Nickel	<b>7.5</b>	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7440-02-0	
Potassium	<b>1120</b>	mg/kg	54.8	20	08/14/15 10:26	08/14/15 15:09	7440-09-7	
Selenium	ND	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7782-49-2	
Silver	ND	mg/kg	0.55	20	08/14/15 10:26	08/14/15 15:09	7440-22-4	
Sodium	<b>133</b>	mg/kg	54.8	20	08/14/15 10:26	08/14/15 15:09	7440-23-5	
Thallium	ND	mg/kg	0.11	20	08/14/15 10:26	08/14/15 15:09	7440-28-0	
Vanadium	<b>25.1</b>	mg/kg	1.1	20	08/14/15 10:26	08/14/15 15:09	7440-62-2	
Zinc	<b>771</b>	mg/kg	27.4	100	08/14/15 10:26	08/14/15 15:38	7440-66-6	

**7471B Mercury**      Analytical Method: EPA 7471B      Preparation Method: EPA 7471B

Mercury	ND	mg/kg	0.020	1	08/14/15 10:24	08/14/15 16:26	7439-97-6	
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**Dry Weight**      Analytical Method: ASTM D2974

Percent Moisture	<b>11.4</b>	%	0.10	1		08/18/15 13:44		
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## ANALYTICAL RESULTS

Project: SIERRA ZINC

Pace Project No.: 10317959

Sample: **SZ-SO-DU9-8** Lab ID: **10317959006** Collected: 08/04/15 08:31 Received: 08/12/15 09:45 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b> Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Aluminum	<b>11400</b>	mg/kg	10.1	20	08/14/15 10:26	08/14/15 15:12	7429-90-5	
Antimony	ND	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7440-36-0	
Arsenic	<b>2.1</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7440-38-2	
Barium	<b>111</b>	mg/kg	0.30	20	08/14/15 10:26	08/14/15 15:12	7440-39-3	
Beryllium	<b>0.35</b>	mg/kg	0.20	20	08/14/15 10:26	08/14/15 15:12	7440-41-7	
Cadmium	<b>2.2</b>	mg/kg	0.081	20	08/14/15 10:26	08/14/15 15:12	7440-43-9	
Calcium	<b>29600</b>	mg/kg	202	100	08/14/15 10:26	08/14/15 15:41	7440-70-2	
Chromium	<b>7.8</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7440-47-3	
Cobalt	<b>4.3</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7440-48-4	
Copper	<b>17.0</b>	mg/kg	1.0	20	08/14/15 10:26	08/14/15 15:12	7440-50-8	
Iron	<b>12200</b>	mg/kg	50.4	20	08/14/15 10:26	08/14/15 15:12	7439-89-6	
Lead	<b>183</b>	mg/kg	0.10	20	08/14/15 10:26	08/14/15 15:12	7439-92-1	
Magnesium	<b>16200</b>	mg/kg	10.1	20	08/14/15 10:26	08/14/15 15:12	7439-95-4	
Manganese	<b>133</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7439-96-5	
Nickel	<b>7.5</b>	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7440-02-0	
Potassium	<b>1180</b>	mg/kg	50.4	20	08/14/15 10:26	08/14/15 15:12	7440-09-7	
Selenium	ND	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7782-49-2	
Silver	ND	mg/kg	0.50	20	08/14/15 10:26	08/14/15 15:12	7440-22-4	
Sodium	<b>164</b>	mg/kg	50.4	20	08/14/15 10:26	08/14/15 15:12	7440-23-5	
Thallium	<b>0.12</b>	mg/kg	0.10	20	08/14/15 10:26	08/14/15 15:12	7440-28-0	
Vanadium	<b>25.2</b>	mg/kg	1.0	20	08/14/15 10:26	08/14/15 15:12	7440-62-2	
Zinc	<b>843</b>	mg/kg	25.2	100	08/14/15 10:26	08/14/15 15:41	7440-66-6	

**7471B Mercury**

Analytical Method: EPA 7471B Preparation Method: EPA 7471B

Mercury	<b>0.028</b>	mg/kg	0.020	1	08/14/15 10:24	08/14/15 16:29	7439-97-6	
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**Dry Weight**

Analytical Method: ASTM D2974

Percent Moisture	<b>5.5</b>	%	0.10	1		08/18/15 13:44		
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Sample: **SZ-SO-DU9-22** Lab ID: **10317959007** Collected: 08/04/15 13:35 Received: 08/12/15 09:45 Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b> Analytical Method: EPA 6020A Preparation Method: EPA 3050								
Aluminum	<b>5490</b>	mg/kg	9.4	20	08/14/15 10:26	08/14/15 15:32	7429-90-5	
Antimony	ND	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7440-36-0	
Arsenic	<b>0.98</b>	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7440-38-2	
Barium	<b>43.6</b>	mg/kg	0.28	20	08/14/15 10:26	08/14/15 15:32	7440-39-3	
Beryllium	<b>0.24</b>	mg/kg	0.19	20	08/14/15 10:26	08/14/15 15:32	7440-41-7	
Cadmium	<b>0.26</b>	mg/kg	0.075	20	08/14/15 10:26	08/14/15 15:32	7440-43-9	
Calcium	<b>2520</b>	mg/kg	37.5	20	08/14/15 10:26	08/14/15 15:32	7440-70-2	
Chromium	<b>4.4</b>	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7440-47-3	
Cobalt	<b>3.2</b>	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7440-48-4	

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## ANALYTICAL RESULTS

Project: SIERRA ZINC

Pace Project No.: 10317959

**Sample: SZ-SO-DU9-22**      **Lab ID: 10317959007**      Collected: 08/04/15 13:35      Received: 08/12/15 09:45      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020A MET ICPMS</b>		Analytical Method: EPA 6020A    Preparation Method: EPA 3050						
Copper	<b>5.2</b>	mg/kg	0.94	20	08/14/15 10:26	08/14/15 15:32	7440-50-8	
Iron	<b>8680</b>	mg/kg	46.8	20	08/14/15 10:26	08/14/15 15:32	7439-89-6	
Lead	<b>14.0</b>	mg/kg	0.094	20	08/14/15 10:26	08/14/15 15:32	7439-92-1	
Magnesium	<b>2050</b>	mg/kg	9.4	20	08/14/15 10:26	08/14/15 15:32	7439-95-4	
Manganese	<b>124</b>	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7439-96-5	
Nickel	<b>3.9</b>	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7440-02-0	
Potassium	<b>836</b>	mg/kg	46.8	20	08/14/15 10:26	08/14/15 15:32	7440-09-7	
Selenium	ND	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7782-49-2	
Silver	ND	mg/kg	0.47	20	08/14/15 10:26	08/14/15 15:32	7440-22-4	
Sodium	<b>72.6</b>	mg/kg	46.8	20	08/14/15 10:26	08/14/15 15:32	7440-23-5	
Thallium	ND	mg/kg	0.094	20	08/14/15 10:26	08/14/15 15:32	7440-28-0	
Vanadium	<b>18.6</b>	mg/kg	0.94	20	08/14/15 10:26	08/14/15 15:32	7440-62-2	
Zinc	<b>255</b>	mg/kg	4.7	20	08/14/15 10:26	08/14/15 15:32	7440-66-6	
<b>7471B Mercury</b>		Analytical Method: EPA 7471B    Preparation Method: EPA 7471B						
Mercury	ND	mg/kg	0.019	1	08/14/15 10:24	08/14/15 16:31	7439-97-6	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>0.23</b>	%	0.10	1		08/18/15 13:44		

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10317959

QC Batch: MERP/14492 Analysis Method: EPA 7471B  
 QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids  
 Associated Lab Samples: 10317959001, 10317959002, 10317959003, 10317959004, 10317959005, 10317959006, 10317959007

METHOD BLANK: 2049891 Matrix: Solid  
 Associated Lab Samples: 10317959001, 10317959002, 10317959003, 10317959004, 10317959005, 10317959006, 10317959007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.018	08/14/15 15:59	

LABORATORY CONTROL SAMPLE: 2049892

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.45	0.49	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2049893 2049894

Parameter	Units	10317986001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.82	1.6	1.7	2.2	2.8	88	116	75-125	22	20	H3,R1

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10317959

QC Batch: MPRP/56954      Analysis Method: EPA 6020A  
 QC Batch Method: EPA 3050      Analysis Description: 6020A Solids UPD4  
 Associated Lab Samples: 10317959001, 10317959002, 10317959003, 10317959004, 10317959005, 10317959006, 10317959007

METHOD BLANK: 2049876      Matrix: Solid  
 Associated Lab Samples: 10317959001, 10317959002, 10317959003, 10317959004, 10317959005, 10317959006, 10317959007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	mg/kg	ND	9.6	08/14/15 14:55	
Antimony	mg/kg	ND	0.48	08/14/15 14:55	
Arsenic	mg/kg	ND	0.48	08/14/15 14:55	
Barium	mg/kg	ND	0.29	08/14/15 14:55	
Beryllium	mg/kg	ND	0.19	08/14/15 14:55	
Cadmium	mg/kg	ND	0.077	08/14/15 14:55	
Calcium	mg/kg	ND	38.5	08/14/15 14:55	
Chromium	mg/kg	ND	0.48	08/14/15 14:55	
Cobalt	mg/kg	ND	0.48	08/14/15 14:55	
Copper	mg/kg	ND	0.96	08/14/15 14:55	
Iron	mg/kg	ND	48.1	08/14/15 14:55	
Lead	mg/kg	ND	0.096	08/14/15 14:55	
Magnesium	mg/kg	ND	9.6	08/14/15 14:55	
Manganese	mg/kg	ND	0.48	08/14/15 14:55	
Nickel	mg/kg	ND	0.48	08/14/15 14:55	
Potassium	mg/kg	ND	48.1	08/14/15 14:55	
Selenium	mg/kg	ND	0.48	08/14/15 14:55	
Silver	mg/kg	ND	0.48	08/14/15 14:55	
Sodium	mg/kg	ND	48.1	08/14/15 14:55	
Thallium	mg/kg	ND	0.096	08/14/15 14:55	
Vanadium	mg/kg	ND	0.96	08/14/15 14:55	
Zinc	mg/kg	ND	4.8	08/14/15 14:55	

LABORATORY CONTROL SAMPLE: 2049877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	mg/kg	19.4	22.5	116	80-120	
Antimony	mg/kg	19.4	20.2	104	80-120	
Arsenic	mg/kg	19.4	20.4	105	80-120	
Barium	mg/kg	19.4	20.8	107	80-120	
Beryllium	mg/kg	19.4	20.3	104	80-120	
Cadmium	mg/kg	19.4	20.8	107	80-120	
Calcium	mg/kg	243	270	111	80-120	
Chromium	mg/kg	19.4	21.4	110	80-120	
Cobalt	mg/kg	19.4	21.7	112	80-120	
Copper	mg/kg	19.4	20.9	108	80-120	
Iron	mg/kg	243	264	109	80-120	
Lead	mg/kg	19.4	21.0	108	80-120	
Magnesium	mg/kg	243	271	111	80-120	
Manganese	mg/kg	19.4	21.7	112	80-120	

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10317959

LABORATORY CONTROL SAMPLE: 2049877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	mg/kg	19.4	21.0	108	80-120	
Potassium	mg/kg	243	269	111	80-120	
Selenium	mg/kg	19.4	20.7	106	80-120	
Silver	mg/kg	19.4	21.3	110	80-120	
Sodium	mg/kg	243	262	108	80-120	
Thallium	mg/kg	19.4	20.9	108	80-120	
Vanadium	mg/kg	19.4	21.8	112	80-120	
Zinc	mg/kg	19.4	20.9	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2049878 2049879

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		10317959001 Result	Spike Conc.	Spike Conc.	MS Result						
Aluminum	mg/kg	11000	20.5	20	12000	12100	5270	5880	75-125	1	20 M6
Antimony	mg/kg	ND	20.5	20	16.0	13.5	76	66	75-125	17	20 M6
Arsenic	mg/kg	5.5	20.5	20	27.4	25.2	107	98	75-125	9	20
Barium	mg/kg	169	20.5	20	213	220	216	256	75-125	3	20 M6
Beryllium	mg/kg	0.35	20.5	20	21.5	20.8	102	102	75-125	3	20
Cadmium	mg/kg	0.57	20.5	20	23.1	22.1	109	108	75-125	4	20
Calcium	mg/kg	41000	257	250	31700	32700	-3610	-3330	75-125	3	20 M6
Chromium	mg/kg	19.0	20.5	20	42.0	41.7	111	113	75-125	1	20
Cobalt	mg/kg	7.5	20.5	20	29.3	29.1	106	108	75-125	1	20
Copper	mg/kg	21.8	20.5	20	41.6	42.3	96	103	75-125	2	20
Iron	mg/kg	18800	257	250	17700	19400	-448	217	75-125	9	20 M6
Lead	mg/kg	16.4	20.5	20	39.2	38.2	111	109	75-125	3	20
Magnesium	mg/kg	11700	257	250	10000	10700	-631	-369	75-125	7	20 M6
Manganese	mg/kg	358	20.5	20	337	385	-100	133	75-125	13	20 M6
Nickel	mg/kg	19.1	20.5	20	40.4	40.7	104	108	75-125	1	20
Potassium	mg/kg	1850	257	250	2280	2290	167	177	75-125	0	20 M6
Selenium	mg/kg	ND	20.5	20	22.9	22.1	109	109	75-125	3	20
Silver	mg/kg	ND	20.5	20	22.3	21.3	108	106	75-125	5	20
Sodium	mg/kg	221	257	250	571	485	136	105	75-125	16	20 M6
Thallium	mg/kg	0.13	20.5	20	22.1	21.1	107	105	75-125	5	20
Vanadium	mg/kg	38.6	20.5	20	64.5	67.0	125	142	75-125	4	20 M6
Zinc	mg/kg	92.8	20.5	20	114	120	102	135	75-125	5	20 M6

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10317959

QC Batch: MPRP/57062

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 10317959001, 10317959002, 10317959003, 10317959004, 10317959005, 10317959006, 10317959007

SAMPLE DUPLICATE: 2053062

Parameter	Units	10317959001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.5	7.7	2	30	

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## QUALIFIERS

Project: SIERRA ZINC

Pace Project No.: 10317959

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

H3 Sample was received or analysis requested beyond the recognized method holding time.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

R1 RPD value was outside control limits.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: SIERRA ZINC

Pace Project No.: 10317959

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10317959001	SZ-TS-07142015	EPA 3050	MPRP/56954	EPA 6020A	ICPM/25906
10317959002	SZ-EB-07202015	EPA 3050	MPRP/56954	EPA 6020A	ICPM/25906
10317959003	SZ-CS-07272015	EPA 3050	MPRP/56954	EPA 6020A	ICPM/25906
10317959004	SZ-SO-DU Z-9	EPA 3050	MPRP/56954	EPA 6020A	ICPM/25906
10317959005	SZ-SO-DU9-3	EPA 3050	MPRP/56954	EPA 6020A	ICPM/25906
10317959006	SZ-SO-DU9-8	EPA 3050	MPRP/56954	EPA 6020A	ICPM/25906
10317959007	SZ-SO-DU9-22	EPA 3050	MPRP/56954	EPA 6020A	ICPM/25906
10317959001	SZ-TS-07142015	EPA 7471B	MERP/14492	EPA 7471B	MERC/16930
10317959002	SZ-EB-07202015	EPA 7471B	MERP/14492	EPA 7471B	MERC/16930
10317959003	SZ-CS-07272015	EPA 7471B	MERP/14492	EPA 7471B	MERC/16930
10317959004	SZ-SO-DU Z-9	EPA 7471B	MERP/14492	EPA 7471B	MERC/16930
10317959005	SZ-SO-DU9-3	EPA 7471B	MERP/14492	EPA 7471B	MERC/16930
10317959006	SZ-SO-DU9-8	EPA 7471B	MERP/14492	EPA 7471B	MERC/16930
10317959007	SZ-SO-DU9-22	EPA 7471B	MERP/14492	EPA 7471B	MERC/16930
10317959001	SZ-TS-07142015	ASTM D2974	MPRP/57062		
10317959002	SZ-EB-07202015	ASTM D2974	MPRP/57062		
10317959003	SZ-CS-07272015	ASTM D2974	MPRP/57062		
10317959004	SZ-SO-DU Z-9	ASTM D2974	MPRP/57062		
10317959005	SZ-SO-DU9-3	ASTM D2974	MPRP/57062		
10317959006	SZ-SO-DU9-8	ASTM D2974	MPRP/57062		
10317959007	SZ-SO-DU9-22	ASTM D2974	MPRP/57062		

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# Surface Water / Soil COC

## RMC

### Laboratory Services Request Form

10317959

<b>I. CLIENT INFORMATION</b>	<b>SEND REQUESTS TO:</b>
Client Name: <u>The Goldfield Corporation – Denise Diaz</u>	<b>Pace Analytical Services, Inc.</b> 1700 Elm Street Minneapolis MN, 55414  Lori Castille Phone: (612) 607-6402
Client Address: <u>1684 W. Hibiscus Blvd. Melbourne, Florida 32901-2631</u>	
Client Phone: <u>321.724.1700</u>	
Client Fax: <u>321.308.1164</u>	
<b>II. ACCOUNT INFORMATION</b>	
Project Name: <u>Sierra Zinc</u>	
Sample Questions: <u>Lyndsey Fox RMC- 801-255-2626</u>	
TAT: <u>Standard</u>	
P.O. No: _____	

<b>III. REPORT INSTRUCTIONS</b>
Report Results To: <u>Lyndsey Fox – RMC (Lyndsey@rmc-ut.com) jim @ rmc-ut.com</u>
Report Address: <u>Lyndsey Fox - RMC, 8496 S. Harrison Street, Suite 102, MIDVALE UT 84047</u>
Please Forward Results By: US Mail ( ) Fed Ex ( ) Fax ( ) Email (X) <u>Lyndsey@rmc-ut.com</u>
Services Requested below are required no later than _____ (date)

**IV. TYPE OF SERVICE REQUESTED**

Please analyze the enclosed environmental samples for:

Lab Use Only Lab No.	Field Sample No./Description	Sampling Date & Time	No. of Cont.	Analysis Requested
	<del>SZ-SO</del>			See Attached table W1 W2 W3 W4 W5 W6 W7
	SZ-TS-07142015	7/14/2015 08:27	1	
	SZ-EB-07202015	7/20/2015 9:13	1	
	SZ-CS-07272015	7/27/15 10:40	1	
	SZ-SO-DU2-9	8/3/15 14:07	1	
	SZ-SO-DU9-3	8/5/15 13:22	1	
	SZ-SO-DU9-8	8/4/15 08:31	1	
	SZ-SO-DU9-22	8/4/15 13:35	1	
notes:				

**V. CHAIN OF CUSTODY RECORD**

Dispatched by: <u>Lyndsey Fox</u>	Date: <u>8/10/2015</u>	Time: <u>18:32</u>	Courier Co. Name
Relinquished by:	Date	Time: <u>08/12/15</u>	Airbill #
Received by: <u>[Signature]</u>	Date: <u>8/12/15</u>	Time: <u>11:18 993</u>	Custody Seal Intact?
Received for lab by:	Date	Time: <u>T=9.2</u>	Yes <input type="checkbox"/> No <input type="checkbox"/>



**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals - Solids (Soil, Rock, Sediments and Tailings)</b>								
		mg/kg	mg/kg					
Al	EPA 6020	2.00	4.00	Glass or Polyethylene	Jar 1	6°C	None	180
Sb	EPA 6020	0.104	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
As	EPA 6020	0.188	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ba	EPA 6020	0.088	0.30	Glass or Polyethylene	Jar 1	6°C	None	180
Be	EPA 6020	0.058	0.20	Glass or Polyethylene	Jar 1	6°C	None	180
Cd	EPA 6020	0.024	0.08	Glass or Polyethylene	Jar 1	6°C	None	180
Ca	EPA 6020	10.00	20.00	Glass or Polyethylene	Jar 1	6°C	None	180
Cr	EPA 6020	0.173	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Co	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Cu	EPA 6020	0.250	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Fe	EPA 6020	10.67	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Pb	EPA 6020	0.030	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
Mg	EPA 6020	2.50	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Mn	EPA 6020	0.108	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ni	EPA 6020	0.107	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
K	EPA 6020	9.86	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Se	EPA 6020	0.198	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Ag	EPA 6020	0.207	0.5	Glass or Polyethylene	Jar 1	6°C	None	180
Na	EPA 6020	20.74	50.00	Glass or Polyethylene	Jar 1	6°C	None	180
Th	EPA 6020	0.036	0.10	Glass or Polyethylene	Jar 1	6°C	None	180
V	EPA 6020	0.050	0.50	Glass or Polyethylene	Jar 1	6°C	None	180
Zn	EPA 6020	1.15	5.00	Glass or Polyethylene	Jar 1	6°C	None	180
Hg	EPA 7471	0.006	0.02	Glass or Polyethylene	Jar 1	6°C	None	180

N/A - Not Applicable TBD - To be determined

Action limits TBD

<sup>1</sup> - Parameters to be collected at each location may vary, detection limits and methods may vary by location and anticipated concentrations.

<sup>2</sup> - All units in ug/L except as noted.

<sup>3</sup> - See bottle list for sample volumes at each sample station. Actual bottle list will be dependent on parameter list for each event and lab requirements.

<sup>4</sup> - Laboratory will measure the temperature of each cooler upon receipt to ensure proper temperature was maintained (4°C +/- 2°C)


<sup>5</sup> - Filtering and preservation may be conducted by Laboratory, field filtered samples will be preserved with HNO<sub>3</sub> (pH<2)

Bottle 1 - TBD volume bottle unfiltered and preserved with HNO<sub>3</sub> for Total Metals.

Bottle 2 - TBD volume bottle . Preserved with HNO<sub>3</sub> after field filtering for Dissolved Metals or unfiltered and unpreserved for laboratory filtered Dissolved Metals .

Jar 1 - To be supplied by laboratory.



	Document Name: <b>Sample Condition Upon Receipt Form</b>	Document Revised: 23Feb2015 Page 1 of 1
	Document No.: <b>F-MN-L-213-rev.13</b>	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: RMC - The Goldfield Corporation Project #: WO# : 10317959



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other: \_\_\_\_\_  
 Tracking Number: 9050 0834 2606

Custody Seal on Cooler/Box Present?  Yes  No Seals Intact?  Yes  No

Optional: Proj. Due Date: \_\_\_\_\_ Proj. Name: \_\_\_\_\_

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_ Temp Blank?  Yes  No

Thermometer Used:  B88A9130516413  B88A912167504  B88A0143310098  
 Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 19.2 Cooler Temp Corrected (°C): 19.2 Melted out of temp  
 Temp should be above freezing to 6°C Correction Factor: TRUE Biological Tissue Frozen?  Yes  No  N/A  
 Date and initials of Person Examining Contents: JM 8/12/15

USDA Regulated Soil (  N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?  Yes  No  
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>Sample 3 no date &amp; time</u>
-Includes Date/Time/ID/Analysis Matrix: <u>SL</u>	
All containers needing acid/base preservation have been checked? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required?  Yes  No

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/Resolution: \_\_\_\_\_

Project Manager Review: Karla Xiang Date: Aug 13 2015

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers).



September 30, 2015

Lyndsey Fox  
Resource Management Consultants  
8136 South State Street  
Suite 2A  
Midvale, UT 84047

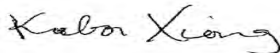
RE: Project: SIERRA ZINC  
Pace Project No.: 10322386

Dear Lyndsey Fox:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kabor Xiong  
kabor.xiong@pacelabs.com  
Project Manager

Enclosures

cc: Jim, Resource Management Consultants



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: SIERRA ZINC

Pace Project No.: 10322386

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Alabama Certification #40770

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: 8TMS-L

Florida/NELAP Certification #: E87605

Guam Certification #:14-008r

Georgia Certification #: 959

Georgia EPD #: Pace

Idaho Certification #: MN00064

Hawaii Certification #MN00064

Illinois Certification #: 200011

Indiana Certification#C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky Dept of Envi. Protection - DW #90062

Kentucky Dept of Envi. Protection - WW #:90062

Louisiana DEQ Certification #: 3086

Louisiana DHH #: LA140001

Maine Certification #: 2013011

Maryland Certification #: 322

Michigan DEPH Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT0092

Nevada Certification #: MN\_00064

Nebraska Certification #: Pace

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Carolina State Public Health #: 27700

North Dakota Certification #: R-036

Ohio EPA #: 4150

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Saipan (CNMI) #:MP0003

South Carolina #:74003001

Texas Certification #: T104704192

Tennessee Certification #: 02818

Utah Certification #: MN000642013-4

Virginia DGS Certification #: 251

Washington Certification #: C486

West Virginia Certification #: 382

West Virginia DHHR #:9952C

Wisconsin Certification #: 999407970

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## SAMPLE SUMMARY

Project: SIERRA ZINC

Pace Project No.: 10322386

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
10322386001	SZ-SW-DC UP-09152015	Water	09/15/15 10:17	09/16/15 10:00
10322386002	SZ-SW-DCUP05-09152015	Water	09/15/15 10:17	09/16/15 10:00
10322386003	SZ-SW-DC DOWN-09152016	Water	09/15/15 10:10	09/16/15 10:00

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### SAMPLE ANALYTE COUNT

Project: SIERRA ZINC

Pace Project No.: 10322386

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10322386001	SZ-SW-DC UP-09152015	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	22	PASI-M
		EPA 245.1	JDD	1	PASI-M
		EPA 245.1	JDD	1	PASI-M
10322386002	SZ-SW-DCUP05-09152015	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	22	PASI-M
		EPA 245.1	JDD	1	PASI-M
		EPA 245.1	JDD	1	PASI-M
10322386003	SZ-SW-DC DOWN-09152016	EPA 200.8	TT3	22	PASI-M
		EPA 200.8	TT3	22	PASI-M
		EPA 245.1	JDD	1	PASI-M
		EPA 245.1	JDD	1	PASI-M

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: SIERRA ZINC

Pace Project No.: 10322386

Sample: **SZ-SW-DC UP-09152015** Lab ID: **10322386001** Collected: 09/15/15 10:17 Received: 09/16/15 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>								
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Aluminum	ND	ug/L	10.0	1	09/22/15 08:43	09/26/15 22:50	7429-90-5	
Antimony	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7440-36-0	
Arsenic	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7440-38-2	
Barium	<b>28.8</b>	ug/L	0.30	1	09/22/15 08:43	09/26/15 22:50	7440-39-3	
Beryllium	ND	ug/L	0.20	1	09/22/15 08:43	09/26/15 22:50	7440-41-7	
Cadmium	ND	ug/L	0.080	1	09/22/15 08:43	09/26/15 22:50	7440-43-9	
Calcium	<b>53700</b>	ug/L	800	20	09/22/15 08:43	09/26/15 22:53	7440-70-2	
Chromium	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7440-47-3	
Cobalt	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7440-48-4	
Copper	ND	ug/L	1.0	1	09/22/15 08:43	09/26/15 22:50	7440-50-8	
Iron	ND	ug/L	50.0	1	09/22/15 08:43	09/26/15 22:50	7439-89-6	
Lead	ND	ug/L	0.10	1	09/22/15 08:43	09/26/15 22:50	7439-92-1	
Magnesium	<b>10100</b>	ug/L	10.0	1	09/22/15 08:43	09/26/15 22:50	7439-95-4	
Manganese	<b>1.3</b>	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7439-96-5	
Nickel	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7440-02-0	
Potassium	<b>1620</b>	ug/L	50.0	1	09/22/15 08:43	09/26/15 22:50	7440-09-7	
Selenium	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7782-49-2	
Silver	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 22:50	7440-22-4	
Sodium	<b>3380</b>	ug/L	50.0	1	09/22/15 08:43	09/26/15 22:50	7440-23-5	
Thallium	ND	ug/L	0.10	1	09/22/15 08:43	09/26/15 22:50	7440-28-0	
Vanadium	ND	ug/L	1.0	1	09/22/15 08:43	09/26/15 22:50	7440-62-2	
Zinc	ND	ug/L	5.0	1	09/22/15 08:43	09/26/15 22:50	7440-66-6	

### 200.8 MET ICPMS, Lab Filtered

Analytical Method: EPA 200.8 Preparation Method: EPA 200.8

Aluminum, Dissolved	ND	ug/L	10.0	1	09/22/15 08:43	09/24/15 18:01	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7440-36-0	
Arsenic, Dissolved	<b>0.54</b>	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7440-38-2	
Barium, Dissolved	<b>32.4</b>	ug/L	0.30	1	09/22/15 08:43	09/24/15 18:01	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	09/22/15 08:43	09/24/15 18:01	7440-41-7	
Cadmium, Dissolved	ND	ug/L	0.080	1	09/22/15 08:43	09/24/15 18:01	7440-43-9	
Calcium, Dissolved	<b>62500</b>	ug/L	800	20	09/22/15 08:43	09/24/15 18:03	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	09/22/15 08:43	09/24/15 18:01	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:01	7439-89-6	
Lead, Dissolved	ND	ug/L	0.10	1	09/22/15 08:43	09/24/15 18:01	7439-92-1	
Magnesium, Dissolved	<b>11500</b>	ug/L	10.0	1	09/22/15 08:43	09/24/15 18:01	7439-95-4	
Manganese, Dissolved	<b>0.95</b>	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7440-02-0	
Potassium, Dissolved	<b>1780</b>	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:01	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:01	7440-22-4	
Sodium, Dissolved	<b>3900</b>	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:01	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	09/22/15 08:43	09/24/15 18:01	7440-28-0	
Vanadium, Dissolved	ND	ug/L	1.0	1	09/22/15 08:43	09/24/15 18:01	7440-62-2	
Zinc, Dissolved	ND	ug/L	5.0	1	09/22/15 08:43	09/24/15 18:01	7440-66-6	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: SIERRA ZINC

Pace Project No.: 10322386

Sample: SZ-SW-DC UP-09152015		Lab ID: 10322386001	Collected: 09/15/15 10:17	Received: 09/16/15 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	ND	ug/L	0.20	1	09/25/15 01:35	09/27/15 18:04	7439-97-6	
<b>245.1 Mercury LL, Lab Filtered</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.010	1	09/23/15 15:40	09/29/15 16:32	7439-97-6	

Sample: SZ-SW-DCUP05-09152015		Lab ID: 10322386002	Collected: 09/15/15 10:17	Received: 09/16/15 10:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum	10.6	ug/L	10.0	1	09/22/15 08:43	09/26/15 23:01	7429-90-5	
Antimony	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7440-36-0	
Arsenic	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7440-38-2	
Barium	29.9	ug/L	0.30	1	09/22/15 08:43	09/26/15 23:01	7440-39-3	
Beryllium	ND	ug/L	0.20	1	09/22/15 08:43	09/26/15 23:01	7440-41-7	
Cadmium	ND	ug/L	0.080	1	09/22/15 08:43	09/26/15 23:01	7440-43-9	
Calcium	59800	ug/L	800	20	09/22/15 08:43	09/26/15 23:04	7440-70-2	
Chromium	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7440-47-3	
Cobalt	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7440-48-4	
Copper	ND	ug/L	1.0	1	09/22/15 08:43	09/26/15 23:01	7440-50-8	
Iron	ND	ug/L	50.0	1	09/22/15 08:43	09/26/15 23:01	7439-89-6	
Lead	ND	ug/L	0.10	1	09/22/15 08:43	09/26/15 23:01	7439-92-1	
Magnesium	10300	ug/L	10.0	1	09/22/15 08:43	09/26/15 23:01	7439-95-4	
Manganese	1.2	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7439-96-5	
Nickel	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7440-02-0	
Potassium	1660	ug/L	50.0	1	09/22/15 08:43	09/26/15 23:01	7440-09-7	
Selenium	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7782-49-2	
Silver	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:01	7440-22-4	
Sodium	3440	ug/L	50.0	1	09/22/15 08:43	09/26/15 23:01	7440-23-5	
Thallium	ND	ug/L	0.10	1	09/22/15 08:43	09/26/15 23:01	7440-28-0	
Vanadium	ND	ug/L	1.0	1	09/22/15 08:43	09/26/15 23:01	7440-62-2	
Zinc	ND	ug/L	5.0	1	09/22/15 08:43	09/26/15 23:01	7440-66-6	
<b>200.8 MET ICPMS, Lab Filtered</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum, Dissolved	ND	ug/L	10.0	1	09/22/15 08:43	09/24/15 18:15	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7440-36-0	
Arsenic, Dissolved	0.51	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7440-38-2	
Barium, Dissolved	31.9	ug/L	0.30	1	09/22/15 08:43	09/24/15 18:15	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	09/22/15 08:43	09/24/15 18:15	7440-41-7	
Cadmium, Dissolved	ND	ug/L	0.080	1	09/22/15 08:43	09/24/15 18:15	7440-43-9	
Calcium, Dissolved	62200	ug/L	800	20	09/22/15 08:43	09/24/15 18:17	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	09/22/15 08:43	09/24/15 18:15	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:15	7439-89-6	

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: SIERRA ZINC  
Pace Project No.: 10322386

Sample: SZ-SW-DCUP05-09152015    Lab ID: 10322386002    Collected: 09/15/15 10:17    Received: 09/16/15 10:00    Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS, Lab Filtered</b> Analytical Method: EPA 200.8    Preparation Method: EPA 200.8								
Lead, Dissolved	ND	ug/L	0.10	1	09/22/15 08:43	09/24/15 18:15	7439-92-1	
Magnesium, Dissolved	<b>11400</b>	ug/L	10.0	1	09/22/15 08:43	09/24/15 18:15	7439-95-4	
Manganese, Dissolved	<b>0.85</b>	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7440-02-0	
Potassium, Dissolved	<b>1740</b>	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:15	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:15	7440-22-4	
Sodium, Dissolved	<b>3820</b>	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:15	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	09/22/15 08:43	09/24/15 18:15	7440-28-0	
Vanadium, Dissolved	ND	ug/L	1.0	1	09/22/15 08:43	09/24/15 18:15	7440-62-2	
Zinc, Dissolved	ND	ug/L	5.0	1	09/22/15 08:43	09/24/15 18:15	7440-66-6	
<b>245.1 Mercury</b> Analytical Method: EPA 245.1    Preparation Method: EPA 245.1								
Mercury	ND	ug/L	0.20	1	09/25/15 01:35	09/27/15 18:07	7439-97-6	
<b>245.1 Mercury LL, Lab Filtered</b> Analytical Method: EPA 245.1    Preparation Method: EPA 245.1								
Mercury, Dissolved	ND	ug/L	0.010	1	09/23/15 15:40	09/29/15 16:35	7439-97-6	

Sample: SZ-SW-DC DOWN-09152016    Lab ID: 10322386003    Collected: 09/15/15 10:10    Received: 09/16/15 10:00    Matrix: Water								
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8    Preparation Method: EPA 200.8								
Aluminum	<b>16.5</b>	ug/L	10.0	1	09/22/15 08:43	09/26/15 23:07	7429-90-5	
Antimony	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7440-36-0	
Arsenic	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7440-38-2	
Barium	<b>30.9</b>	ug/L	0.30	1	09/22/15 08:43	09/26/15 23:07	7440-39-3	
Beryllium	ND	ug/L	0.20	1	09/22/15 08:43	09/26/15 23:07	7440-41-7	
Cadmium	ND	ug/L	0.080	1	09/22/15 08:43	09/26/15 23:07	7440-43-9	
Calcium	<b>59900</b>	ug/L	800	20	09/22/15 08:43	09/26/15 23:12	7440-70-2	
Chromium	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7440-47-3	
Cobalt	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7440-48-4	
Copper	ND	ug/L	1.0	1	09/22/15 08:43	09/26/15 23:07	7440-50-8	
Iron	ND	ug/L	50.0	1	09/22/15 08:43	09/26/15 23:07	7439-89-6	
Lead	ND	ug/L	0.10	1	09/22/15 08:43	09/26/15 23:07	7439-92-1	
Magnesium	<b>10500</b>	ug/L	10.0	1	09/22/15 08:43	09/26/15 23:07	7439-95-4	
Manganese	<b>1.1</b>	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7439-96-5	
Nickel	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7440-02-0	
Potassium	<b>1710</b>	ug/L	50.0	1	09/22/15 08:43	09/26/15 23:07	7440-09-7	
Selenium	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7782-49-2	
Silver	ND	ug/L	0.50	1	09/22/15 08:43	09/26/15 23:07	7440-22-4	
Sodium	<b>3510</b>	ug/L	50.0	1	09/22/15 08:43	09/26/15 23:07	7440-23-5	
Thallium	ND	ug/L	0.10	1	09/22/15 08:43	09/26/15 23:07	7440-28-0	
Vanadium	ND	ug/L	1.0	1	09/22/15 08:43	09/26/15 23:07	7440-62-2	

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## ANALYTICAL RESULTS

Project: SIERRA ZINC

Pace Project No.: 10322386

**Sample:** SZ-SW-DC DOWN-09152016      **Lab ID:** 10322386003      Collected: 09/15/15 10:10      Received: 09/16/15 10:00      Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Zinc	ND	ug/L	5.0	1	09/22/15 08:43	09/26/15 23:07	7440-66-6	
<b>200.8 MET ICPMS, Lab Filtered</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8						
Aluminum, Dissolved	ND	ug/L	10.0	1	09/22/15 08:43	09/24/15 18:20	7429-90-5	
Antimony, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7440-36-0	
Arsenic, Dissolved	<b>0.52</b>	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7440-38-2	
Barium, Dissolved	<b>31.7</b>	ug/L	0.30	1	09/22/15 08:43	09/24/15 18:20	7440-39-3	
Beryllium, Dissolved	ND	ug/L	0.20	1	09/22/15 08:43	09/24/15 18:20	7440-41-7	
Cadmium, Dissolved	ND	ug/L	0.080	1	09/22/15 08:43	09/24/15 18:20	7440-43-9	
Calcium, Dissolved	<b>62000</b>	ug/L	800	20	09/22/15 08:43	09/24/15 18:23	7440-70-2	
Chromium, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7440-47-3	
Cobalt, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7440-48-4	
Copper, Dissolved	ND	ug/L	1.0	1	09/22/15 08:43	09/24/15 18:20	7440-50-8	
Iron, Dissolved	ND	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:20	7439-89-6	
Lead, Dissolved	ND	ug/L	0.10	1	09/22/15 08:43	09/24/15 18:20	7439-92-1	
Magnesium, Dissolved	<b>11300</b>	ug/L	10.0	1	09/22/15 08:43	09/24/15 18:20	7439-95-4	
Manganese, Dissolved	<b>0.75</b>	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7439-96-5	
Nickel, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7440-02-0	
Potassium, Dissolved	<b>1730</b>	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:20	7440-09-7	
Selenium, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7782-49-2	
Silver, Dissolved	ND	ug/L	0.50	1	09/22/15 08:43	09/24/15 18:20	7440-22-4	
Sodium, Dissolved	<b>3770</b>	ug/L	50.0	1	09/22/15 08:43	09/24/15 18:20	7440-23-5	
Thallium, Dissolved	ND	ug/L	0.10	1	09/22/15 08:43	09/24/15 18:20	7440-28-0	
Vanadium, Dissolved	ND	ug/L	1.0	1	09/22/15 08:43	09/24/15 18:20	7440-62-2	
Zinc, Dissolved	ND	ug/L	5.0	1	09/22/15 08:43	09/24/15 18:20	7440-66-6	
<b>245.1 Mercury</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury	ND	ug/L	0.20	1	09/25/15 01:35	09/27/15 18:09	7439-97-6	
<b>245.1 Mercury LL, Lab Filtered</b>		Analytical Method: EPA 245.1 Preparation Method: EPA 245.1						
Mercury, Dissolved	ND	ug/L	0.010	1	09/23/15 15:40	09/29/15 16:38	7439-97-6	

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10322386

QC Batch: MERP/14856 Analysis Method: EPA 245.1  
 QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury  
 Associated Lab Samples: 10322386001, 10322386002, 10322386003

METHOD BLANK: 2086896 Matrix: Water

Associated Lab Samples: 10322386001, 10322386002, 10322386003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	09/27/15 17:54	

LABORATORY CONTROL SAMPLE: 2086897

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2086898 2086899

Parameter	Units	92268301001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Mercury	ug/L	ND	5	4.9	5	5.0	98	100	70-130	2	20	

MATRIX SPIKE SAMPLE: 2086900

Parameter	Units	10323214001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	4.6	90	70-130	

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### QUALITY CONTROL DATA

Project: SIERRA ZINC  
Pace Project No.: 10322386

QC Batch: MERP/14861 Analysis Method: EPA 245.1  
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury - Dissolved, LL  
Associated Lab Samples: 10322386001, 10322386002, 10322386003

METHOD BLANK: 2086918 Matrix: Water  
Associated Lab Samples: 10322386001, 10322386002, 10322386003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury, Dissolved	ug/L	ND	0.010	09/29/15 15:41	

LABORATORY CONTROL SAMPLE: 2086919

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	.25	0.23	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2086920 2086921

Parameter	Units	10321832004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury, Dissolved	ug/L	ND	.25	.25	0.23	0.24	91	96	70-130	6	20	

MATRIX SPIKE SAMPLE: 2086922

Parameter	Units	10322386003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury, Dissolved	ug/L	ND	.25	0.24	98	70-130	

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10322386

QC Batch: MPRP/57926 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 10322386001, 10322386002, 10322386003

METHOD BLANK: 2082503 Matrix: Water

Associated Lab Samples: 10322386001, 10322386002, 10322386003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	10.0	09/24/15 18:12	
Antimony	ug/L	ND	0.50	09/24/15 18:12	
Arsenic	ug/L	ND	0.50	09/24/15 18:12	
Barium	ug/L	ND	0.30	09/24/15 18:12	
Beryllium	ug/L	ND	0.20	09/24/15 18:12	
Cadmium	ug/L	ND	0.080	09/24/15 18:12	
Calcium	ug/L	ND	40.0	09/24/15 18:12	
Chromium	ug/L	ND	0.50	09/24/15 18:12	
Cobalt	ug/L	ND	0.50	09/24/15 18:12	
Copper	ug/L	ND	1.0	09/24/15 18:12	
Iron	ug/L	ND	50.0	09/24/15 18:12	
Lead	ug/L	ND	0.10	09/24/15 18:12	
Magnesium	ug/L	ND	10.0	09/24/15 18:12	
Manganese	ug/L	ND	0.50	09/24/15 18:12	
Nickel	ug/L	ND	0.50	09/24/15 18:12	
Potassium	ug/L	ND	50.0	09/24/15 18:12	
Selenium	ug/L	ND	0.50	09/24/15 18:12	
Silver	ug/L	ND	0.50	09/24/15 18:12	
Sodium	ug/L	ND	50.0	09/24/15 18:12	
Thallium	ug/L	ND	0.10	09/24/15 18:12	
Vanadium	ug/L	ND	1.0	09/24/15 18:12	
Zinc	ug/L	ND	5.0	09/24/15 18:12	

LABORATORY CONTROL SAMPLE: 2082504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	80	88.0	110	85-115	
Antimony	ug/L	80	88.2	110	85-115	
Arsenic	ug/L	80	88.9	111	85-115	
Barium	ug/L	80	89.6	112	85-115	
Beryllium	ug/L	80	87.0	109	85-115	
Cadmium	ug/L	80	90.3	113	85-115	
Calcium	ug/L	1000	1080	108	85-115	
Chromium	ug/L	80	91.7	115	85-115	
Cobalt	ug/L	80	87.9	110	85-115	
Copper	ug/L	80	86.9	109	85-115	
Iron	ug/L	1000	1110	111	85-115	
Lead	ug/L	80	87.5	109	85-115	
Magnesium	ug/L	1000	1120	112	85-115	
Manganese	ug/L	80	91.7	115	85-115	

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10322386

LABORATORY CONTROL SAMPLE: 2082504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel	ug/L	80	87.4	109	85-115	
Potassium	ug/L	1000	1110	111	85-115	
Selenium	ug/L	80	89.8	112	85-115	
Silver	ug/L	80	87.8	110	85-115	
Sodium	ug/L	1000	1110	111	85-115	
Thallium	ug/L	80	91.2	114	85-115	
Vanadium	ug/L	80	91.7	115	85-115	
Zinc	ug/L	80	91.3	114	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2082505 2082506

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		10322267001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Aluminum	ug/L	128	80	80	282	315	193	234	70-130	11	20	M1
Antimony	ug/L	ND	80	80	84.3	84.9	105	106	70-130	1	20	
Arsenic	ug/L	ND	80	80	85.8	86.2	107	107	70-130	0	20	
Barium	ug/L	35.2	80	80	120	120	106	106	70-130	0	20	
Beryllium	ug/L	ND	80	80	82.6	82.8	103	103	70-130	0	20	
Cadmium	ug/L	0.27	80	80	86.7	86.8	108	108	70-130	0	20	
Calcium	ug/L	159000	1000	1000	158000	160000	-123	85	70-130	1	20	E,M1
Chromium	ug/L	0.70	80	80	87.7	88.3	109	110	70-130	1	20	
Cobalt	ug/L	ND	80	80	82.8	83.4	103	104	70-130	1	20	
Copper	ug/L	1.1	80	80	82.6	83.4	102	103	70-130	1	20	
Iron	ug/L	113	1000	1000	1180	1180	106	107	70-130	1	20	
Lead	ug/L	0.19	80	80	83.3	84.6	104	106	70-130	2	20	
Magnesium	ug/L	31600	1000	1000	32900	33600	125	195	70-130	2	20	M1
Manganese	ug/L	108	80	80	198	198	112	112	70-130	0	20	
Nickel	ug/L	8.7	80	80	90.5	90.9	102	103	70-130	0	20	
Potassium	ug/L	1090	1000	1000	2130	2160	103	107	70-130	2	20	
Selenium	ug/L	140	80	80	220	219	100	99	70-130	0	20	
Silver	ug/L	ND	80	80	86.5	87.0	108	109	70-130	1	20	
Sodium	ug/L	12500	1000	1000	13200	13600	73	108	70-130	3	20	
Thallium	ug/L	ND	80	80	89.7	90.4	112	113	70-130	1	20	
Vanadium	ug/L	ND	80	80	89.3	89.9	111	112	70-130	1	20	
Zinc	ug/L	5.4	80	80	91.8	92.5	108	109	70-130	1	20	

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### QUALITY CONTROL DATA

Project: SIERRA ZINC  
Pace Project No.: 10322386

QC Batch: MPRP/57915 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved  
Associated Lab Samples: 10322386001, 10322386002, 10322386003

METHOD BLANK: 2082440 Matrix: Water  
Associated Lab Samples: 10322386001, 10322386002, 10322386003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	ND	10.0	09/24/15 17:05	
Antimony, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Arsenic, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Barium, Dissolved	ug/L	ND	0.30	09/24/15 17:05	
Beryllium, Dissolved	ug/L	ND	0.20	09/24/15 17:05	
Cadmium, Dissolved	ug/L	ND	0.080	09/24/15 17:05	
Calcium, Dissolved	ug/L	ND	40.0	09/24/15 17:05	
Chromium, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Cobalt, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Copper, Dissolved	ug/L	ND	1.0	09/24/15 17:05	
Iron, Dissolved	ug/L	ND	50.0	09/24/15 17:05	
Lead, Dissolved	ug/L	ND	0.10	09/24/15 17:05	
Magnesium, Dissolved	ug/L	ND	10.0	09/24/15 17:05	
Manganese, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Nickel, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Potassium, Dissolved	ug/L	ND	50.0	09/24/15 17:05	
Selenium, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Silver, Dissolved	ug/L	ND	0.50	09/24/15 17:05	
Sodium, Dissolved	ug/L	ND	50.0	09/24/15 17:05	
Thallium, Dissolved	ug/L	ND	0.10	09/24/15 17:05	
Vanadium, Dissolved	ug/L	ND	1.0	09/24/15 17:05	
Zinc, Dissolved	ug/L	ND	5.0	09/24/15 17:05	

LABORATORY CONTROL SAMPLE: 2082441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	80	87.3	109	85-115	
Antimony, Dissolved	ug/L	80	82.8	103	85-115	
Arsenic, Dissolved	ug/L	80	84.0	105	85-115	
Barium, Dissolved	ug/L	80	83.6	104	85-115	
Beryllium, Dissolved	ug/L	80	86.0	107	85-115	
Cadmium, Dissolved	ug/L	80	84.8	106	85-115	
Calcium, Dissolved	ug/L	1000	1020	102	85-115	
Chromium, Dissolved	ug/L	80	86.2	108	85-115	
Cobalt, Dissolved	ug/L	80	88.4	111	85-115	
Copper, Dissolved	ug/L	80	85.5	107	85-115	
Iron, Dissolved	ug/L	1000	1100	110	85-115	
Lead, Dissolved	ug/L	80	84.1	105	85-115	
Magnesium, Dissolved	ug/L	1000	1080	108	85-115	
Manganese, Dissolved	ug/L	80	90.8	114	85-115	

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### QUALITY CONTROL DATA

Project: SIERRA ZINC

Pace Project No.: 10322386

LABORATORY CONTROL SAMPLE: 2082441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nickel, Dissolved	ug/L	80	85.5	107	85-115	
Potassium, Dissolved	ug/L	1000	1030	103	85-115	
Selenium, Dissolved	ug/L	80	86.0	107	85-115	
Silver, Dissolved	ug/L	80	90.2	113	85-115	
Sodium, Dissolved	ug/L	1000	1090	109	85-115	
Thallium, Dissolved	ug/L	80	89.3	112	85-115	
Vanadium, Dissolved	ug/L	80	89.6	112	85-115	
Zinc, Dissolved	ug/L	80	87.9	110	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2082442 2082443

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		10322267001 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Aluminum, Dissolved	ug/L	33.9	80	80	126	132	115	123	70-130	5	20
Antimony, Dissolved	ug/L	ND	80	80	85.9	86.7	107	108	70-130	1	20
Arsenic, Dissolved	ug/L	ND	80	80	87.0	88.1	109	110	70-130	1	20
Barium, Dissolved	ug/L	33.9	80	80	119	120	107	108	70-130	1	20
Beryllium, Dissolved	ug/L	ND	80	80	80.3	84.1	100	105	70-130	5	20
Cadmium, Dissolved	ug/L	0.27	80	80	89.2	88.6	111	110	70-130	1	20
Calcium, Dissolved	ug/L	154000	1000	1000	158000	161000	405	761	70-130	2	20 E,M1
Chromium, Dissolved	ug/L	0.60	80	80	88.5	89.7	110	111	70-130	1	20
Cobalt, Dissolved	ug/L	ND	80	80	90.3	91.5	113	114	70-130	1	20
Copper, Dissolved	ug/L	1.3	80	80	88.6	89.6	109	110	70-130	1	20
Iron, Dissolved	ug/L	ND	1000	1000	1140	1160	112	115	70-130	2	20
Lead, Dissolved	ug/L	ND	80	80	86.5	87.1	108	109	70-130	1	20
Magnesium, Dissolved	ug/L	32700	1000	1000	34100	35000	136	229	70-130	3	20 M1
Manganese, Dissolved	ug/L	87.9	80	80	181	186	116	122	70-130	3	20
Nickel, Dissolved	ug/L	8.4	80	80	95.2	96.0	109	110	70-130	1	20
Potassium, Dissolved	ug/L	988	1000	1000	2010	2030	102	105	70-130	1	20
Selenium, Dissolved	ug/L	140	80	80	205	220	81	100	70-130	7	20
Silver, Dissolved	ug/L	ND	80	80	91.9	92.9	115	116	70-130	1	20
Sodium, Dissolved	ug/L	12900	1000	1000	14100	14400	120	157	70-130	3	20 M1
Thallium, Dissolved	ug/L	ND	80	80	92.0	92.4	115	115	70-130	0	20
Vanadium, Dissolved	ug/L	ND	80	80	94.7	96.4	118	120	70-130	2	20
Zinc, Dissolved	ug/L	5.9	80	80	93.7	95.8	110	112	70-130	2	20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc..



## QUALIFIERS

Project: SIERRA ZINC

Pace Project No.: 10322386

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: SIERRA ZINC

Pace Project No.: 10322386

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10322386001	SZ-SW-DC UP-09152015	EPA 200.8	MPRP/57926	EPA 200.8	ICPM/26460
10322386002	SZ-SW-DCUP05-09152015	EPA 200.8	MPRP/57926	EPA 200.8	ICPM/26460
10322386003	SZ-SW-DC DOWN-09152016	EPA 200.8	MPRP/57926	EPA 200.8	ICPM/26460
10322386001	SZ-SW-DC UP-09152015	EPA 200.8	MPRP/57915	EPA 200.8	ICPM/26458
10322386002	SZ-SW-DCUP05-09152015	EPA 200.8	MPRP/57915	EPA 200.8	ICPM/26458
10322386003	SZ-SW-DC DOWN-09152016	EPA 200.8	MPRP/57915	EPA 200.8	ICPM/26458
10322386001	SZ-SW-DC UP-09152015	EPA 245.1	MERP/14856	EPA 245.1	MERC/17349
10322386002	SZ-SW-DCUP05-09152015	EPA 245.1	MERP/14856	EPA 245.1	MERC/17349
10322386003	SZ-SW-DC DOWN-09152016	EPA 245.1	MERP/14856	EPA 245.1	MERC/17349
10322386001	SZ-SW-DC UP-09152015	EPA 245.1	MERP/14861	EPA 245.1	MERC/17335
10322386002	SZ-SW-DCUP05-09152015	EPA 245.1	MERP/14861	EPA 245.1	MERC/17335
10322386003	SZ-SW-DC DOWN-09152016	EPA 245.1	MERP/14861	EPA 245.1	MERC/17335

### REPORT OF LABORATORY ANALYSIS

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**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
<b>Metals Water- Dissolved</b>				Polyethylene	Bottle 2	6°C	See Note 5	180
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 2	6°C	See Note 5	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 2	6°C	See Note 5	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	See Note 5	180
Cd	EPA 200.8	0.092	0.08	Polyethylene	Bottle 1	6°C	See Note 5	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 2	6°C	See Note 5	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 2	6°C	See Note 5	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 2	6°C	See Note 5	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 2	6°C	See Note 5	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 2	6°C	See Note 5	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 2	6°C	See Note 5	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 2	6°C	See Note 5	180



**Table 1**  
Sample Collection Guide - Target Analytes and Collection Requirements

QUALITY ASSURANCE PROJECT PLAN (QAPP)  
SIERRA ZINC MINE AND MILL SITE

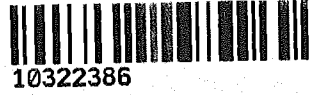
Parameters <sup>1</sup>	Method	Method Detection Limits <sup>2</sup>	Method Reporting Limits <sup>2</sup>	Container	Volume <sup>3</sup>	Temperature <sup>4</sup>	Preservative	Hold Days
pH, Temperature, Conductivity, Redox, Dissolved Oxygen, Flow	Field	NA	NA	Instream and/or Polyethylene	500 ml	NA	None	NA
<b>Metals Water - Total</b>								
Al	EPA 200.8	1.49	4	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Sb	EPA 200.8	0.056	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
As	EPA 200.8	0.093	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ba	EPA 200.8	0.140	0.3	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Be	EPA 200.8	0.053	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cd	EPA 200.8	0.032	0.08	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ca	EPA 200.8	9.776	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cr	EPA 200.8	0.081	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Co	EPA 200.8	0.052	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Cu	EPA 200.8	0.174	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Fe	EPA 200.8	5.90	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Pb	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mg	EPA 200.8	2.38	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Mn	EPA 200.8	0.183	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Hg	EPA 200.8	0.032	0.2	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ni	EPA 200.8	0.154	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
K	EPA 200.8	4.71	20	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Se	EPA 200.8	0.118	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Ag	EPA 200.8	0.050	0.5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Na	EPA 200.8	10.27	50	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Th	EPA 200.8	0.025	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
V	EPA 200.8	0.046	0.1	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180
Zn	EPA 200.8	0.98	5	Polyethylene	Bottle 1	6°C	HNO3(pH<2)	180



**Sample Condition Upon Receipt**

Client Name: Goldfield Corp

Project #: **WO# : 10322386**



Courier:  Fed Ex  UPS  USPS  Client  
 Commercial  Pace  SpeeDee  Other: \_\_\_\_\_  
 Tracking Number: 8081 9960 5382

Custody Seal on Cooler/Box Present?  Yes  No      Seals Intact?  Yes  No      Optional: Proj. Due Date:      Proj. Name:

Packing Material:  Bubble Wrap  Bubble Bags  None  Other: \_\_\_\_\_      Temp Blank?  Yes  No

Thermometer Used:  B88A9130516413  B88A912167504  B88A0143310098      Type of Ice:  Wet  Blue  None  Samples on ice, cooling process has begun

Cooler Temp Read (°C): 1.2      Cooler Temp Corrected (°C): 1.4      Biological Tissue Frozen?  Yes  No  N/A  
 Temp should be above freezing to 6°C      Correction Factor: -0.2      Date and Initials of Person Examining Contents: WT 9-16-15

**USDA Regulated Soil** (  N/A, water sample)  
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or WA (check maps)?  Yes  No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No  
**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

	COMMENTS:
Chain of Custody Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered Volume Received for Dissolved Tests? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>	
All containers needing acid/base preservation have been checked? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input checked="" type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH >9 Sulfide, NaOH >12 Cyanide) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample # <u>1/1 1-3</u>
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____	

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_      Field Data Required?  Yes  No  
 Comments/Resolution: \_\_\_\_\_

**Project Manager Review:**

Kurt Xiang

Date: Sept. 17, 2015

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers).



## **APPENDIX C**

### **Barrel Disposal Manifests**





**INVOICE**  
Invoice No 1000895624

**REMIT TO:**

Clean Harbors Env. Services  
PO Box 3442  
Boston, MA 02241-3442

EIN: 04-2698999

**SOLD TO:**

Scott Sullens  
ACI Northwest Incorporated  
6600 North Government Way  
Coeur d'Alene, ID 83815 - 0000

**OFFICE:**

Clean Harbors Env Services Inc  
26328 79th Avenue South  
Kent, WA 98032  
(253) 639-4240

*If you have any questions regarding this invoice, please contact your customer service representative at the telephone number listed above*

**JOB SITE/GENERATOR:**

ACI - Sierra Zinc Mine Site  
2462 Goldfield Mine Road  
Colville, WA 99114 - 0000

**Job Description:** Drum Shipments

**\*\* Payable in USD funds \*\***

Last Service Date	Invoice No	Customer	Branch	Sales Order	Purchase Order	Terms
20 Mar 2015	1000895624	AC19361	DI	1500873897	14066-05	NET 15 DAYS

**SUMMARY BY LINE TYPE**

Disposal	\$2,233.90
Fees	\$418.39
Material	\$270.00
Transportation	\$1,098.17
<b>SUBTOTAL</b>	<b>\$4,020.46 USD</b>
<b>TAX</b>	<b>\$20.52 USD</b>
<b>INVOICE TOTAL</b>	<b>\$4,040.98 USD</b>
<b>DUE DATE</b>	<b>30 Apr 2015</b>

← **PLEASE PAY THIS AMOUNT**  
← **REMIT PAYMENT BY**

Manifest Info	Item ID	Description	Shipment Qty	Shipment UOM	Billing Qty	Billing UOM	Unit Price	Amount
---------------	---------	-------------	--------------	--------------	-------------	-------------	------------	--------

**20 Mar 2015**

000591262FLE 1	DISPSL / CCRKS	Methyl Isobutyl Carbinol Residual Sludge CH928325	2	DM	2.000	85DM	568.0000	\$1,136.00
	FEE-DISP	Nebraska Hazardous Waste Treatment/Incineration Fee			0.296	T	1.9200	\$0.57
000591262FLE 2	DISPSL / B40	50240 Carburetor Parts Dip - Methylene Chloride CH928333	1	DM	1.000	85DM	375.0000	\$375.00
	FEE-DISP	Nebraska Hazardous Waste Treatment/Incineration Fee			0.127	T	1.9200	\$0.24
000591262FLE 3	DISPSL / FB1	Methyl Isobutyl Carbinol CH928447	2	DM	2.000	85DM	135.0000	\$270.00
	FEE-DISP	Nebraska Hazardous Waste Treatment/Incineration Fee			0.230	T	1.9200	\$0.44
000591262FLE	TRAN	TRANSPORTATION			1.000	EA	477.0000	\$477.00
	HUBTRANS	Freight to manifested disposal facility			6.250	EA	51.7440	\$323.40
000591261FLE	DISPSL /	White Powder Barrel 2 - characterized	1	DM	1.000	95DF	189.7900	\$189.79

Interest will be charged at a rate of 1.5% per month for all past due amounts.





**INVOICE**  
Invoice No 1000895624

Manifest Info	Item ID	Description	Shipment Qty	Shipment UOM	Billing Qty	Billing UOM	Unit Price	Amount
1	CBP	with analytical CH928453						
	FEE-DISP	Utah Non-Hazardous Waste for Disposal			0.395	T	2.5000	\$0.99
	TRANSDOWN	000591261FLE/1 Trans to ultimate disposal facility			1.000	EA	5.7800	\$5.78
	HUBTRANS	Freight to manifested disposal facility			1.000	EA	37.7482	\$37.75
000591260FLE 1	DISPSL / D23P	Empty Drum Last Containing Cyanide CH928441	1	DM	1.000	55DM	162.6626	\$162.66
	FEE-DISP	Utah Hazardous Waste for Disposal			0.036	T	35.0000	\$1.26
000591260FLE 2	DISPSL / D23	EMPTY DRUMS CH928458	1	DM	1.000	85DM	59.4500	\$59.45
000591260FLE 2	DISPSL / D23	EMPTY DRUMS CH928458	1	DM	1.000	55DM	41.0000	\$41.00
	FEE-DOWN	Utah Non-Hazardous Waste for Disposal			0.088	T	2.5000	\$0.22
	TRANSDOWN	000591260FLE/2 Trans to ultimate disposal facility			2.000	EA	12.2800	\$24.56
	HUBTRANS	Freight to manifested disposal facility			3.250	EA	37.7482	\$122.68
	DM95POLY	95 Gal Poly Drum 1H2/Y318/S (Overpack)			1.000	EA	270.0000 T	\$270.00
	DEM	Loading Demurrage			1.000	HR	107.0000	\$107.00
	FEE	Recovery Fee			3,605.790	EA	0.1150	\$414.67
							<b>SUBTOTAL</b>	<b>\$4,020.46</b>
							<b>TAX</b>	<b>\$20.52</b>
							<b>TOTAL</b>	<b>\$4,040.98</b>

T indicates SALES TAXABLE ITEM

Interest will be charged at a rate of 1.5% per month for all past due amounts.



**EMERALD SERVICES, INC.**

1-888-832-3008

**Customer Bill of Lading - Washington**

Bill of Lading # **35913**

**THIS IS NOT AN INVOICE**

Manifest # 70114703407

**Destination Facilities (check all that apply):**

- 1500 Airport Way South Seattle, WA 98134 EPA ID#WAD058367152
  1825 Alexander Avenue Tacoma, WA 98421 EPA ID#WAD981769110
  1799 East Ainsworth Pasco, WA 99301 EPA ID#WAH000041824
  6308 E Sharp Ave Spokane Valley, WA 99212 EPA ID#WAH000042987
  1300 West 12th Street Vancouver, WA 98660 EPA ID#WAD068794387

Generator/Business Name: <u>Stavro Zinc Mine</u>		Business Phone	Date: <u>12/30/11</u>
Generator Site Address: <u>3167 6th Street Wye Colville, WA 99114</u>		Billing Address: <u>6600 N. Government CPA, ID 8255</u>	Driver Name: <u>THANON</u>
Site Contact Person: (Name, Phone)		A/P Contact Person: (Name, Phone)	Route Number: <u>115</u>
Site Contact Email:		A/P Contact Email:	Equipment Number: <u>88</u>
Transporter: <b>Emerald Services, Inc.</b>		Transporter ID# <b>WAD058364647</b>	P.O. Number: <u>103676</u>
			Industrial Order Number: <u>150310</u>

**Products & Services**

Service Levels and Frequency/s:

Item	HM	Product Name	Profile Number	# of Cont.	Cont. Type	Qty/ Vol.	UOM	Unit Price	Amount
		Used Oil - Not Regulated by DOT / Net Oil Volume Collected	G00505						
10015		Chlor D Tect Test TM / HH (Not intended for detection of PCBs) <b>PASS / FAIL</b>							
06009		Off Spec Fuel UN1993, Flammable Liquids, n.o.s. (Gasoline), 3, PGII, ERG#128	G02901						
		Part-Washer Service INTERVAL _____ MOD / COM							
1107		Used 150 Solvent (MANIFEST REQUIRED IF MQG OR LQG) NA1993, Combustible Liquid, n.o.s. (benzene, lead), COMB, PGIII, ERG#128	88882						
03001		Spent Antifreeze (Recycling at Emerald Tacoma) Material not regulated by DOT (Washington State Dangerous Waste Only, Toxic)	AF78						
		Antifreeze, New 100% / 50-50 Green / Yellow / Red							
		<u>6000 11510</u>	<u>31903</u>	<u>3</u>	<u>DM</u>	<u>150 GAL</u>			
		Used Oil Filters - Not regulated by DOT Crushed / Uncrushed	G04715						
01001		Used Absorbant Pads	G00504						
9162677		Service & Compliance Fee / Screening Fee							
9020977		Energy Recovery Fee				<u>1 HA</u>			
3391061		Truck/Operator Time				<u>4 HR</u>			
		Subtotal							
		Sales Tax ( _____ % )							

Payment Method: Driver Check / Corporate Check / Account Credit **TOTAL AMOUNT:**

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I further declare that this material is not regulated as a hazardous waste, dangerous waste, or PCB waste under WAC 173-303, 40CFR Part 261, or 40 CFR Part 761 unless otherwise described on an accompanying hazardous waste manifest. If shipping used oil, as generator, I certify that this used oil meets the definition of used oil in 40 CFR Part 279 and WAC 173-303-515. Generator agrees to indemnify and hold harmless Emerald Services, Inc. or its subsidiaries for any damages, costs, attorney's fees, and expert fees arising out of or in any way related to a breach of the above certifications. **CHEMTREC, 24 Hour Emergency Response Line 1-800-424-9300 Contract #761**

Generator Authorized Rep. Printed Name:

Generator Authorized Rep. Signature / Date:

Transporter Signature / Date:

**See Reverse Side for Terms and Conditions**

**CUSTOMER**



<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number <b>004447384</b>	<b>FLE</b>
5. Generator's Name and Mailing Address				Generator's Site Address (if different than mailing address)		
Generator's Phone:						
6. Transporter 1 Company Name				U.S. EPA ID Number		
7. Transporter 2 Company Name				U.S. EPA ID Number		
8. Designated Facility Name and Site Address				U.S. EPA ID Number		
Facility's Phone:						
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
1.						
2.						
3.						
4.						
14. Special Handling Instructions and Additional Information						
<p>15. <b>GENERATOR'S/OFFEROR'S CERTIFICATION:</b> I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.</p>						
Generator's/Offeror's Printed/Typed Name				Signature		Month Day Year
16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____						
17. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name				Signature		Month Day Year
Transporter 2 Printed/Typed Name				Signature		Month Day Year
18. Discrepancy						
18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection						
18b. Alternate Facility (or Generator)				Manifest Reference Number: _____ U.S. EPA ID Number		
Facility's Phone:						
18c. Signature of Alternate Facility (or Generator)						Month Day Year
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)						
1.	2.	3.	4.			
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a						
Printed/Typed Name				Signature		Month Day Year

GENERATOR

TRANSPORTER INT'L

DESIGNATED FACILITY



603670

**Emerald Environmental Services - A Division of Emerald Service, Inc.**

Ordered: 12/16/2014

Requested Pick Up By: 12/23/2014

Order: **150380**

7343 E. Marginal Way South, Seattle, WA 98108 Tel: (206) 832 - 3000

<b>Customer:</b>	<b>P.O. No.:</b>	<b>Generator / Site:</b>	EPA ID	EXEMPT
Customer #	ACI1000	Generator #	ESISIEZINC	State ID
Billing Company	ACI NORTHWEST INC	Generator Name	SIERRA ZINC MINE	
Address	6600 N GOVERNMENT	Address	2462 GOLDFIELD MINE RD	
City ST Zip	COUER DALENE, ID 83815	City ST Zip	COLVILLE, WA 99114	
Contact		Contact		
Phone, Fax		Phone, Fax		
Sales Person	DAVE BLACKHAM	Account Manager	DANIELLE RINEHART	

**Order Lines:**

Item	Description	Profile	Quantity	Unit	Reference Document

**Instructions for Drivers:**

PLEASE PICK UP 1 X 55DM OF USED GREASE

GENERATOR HAS ALREADY BEEN BILLED FOR THIS SHIPMENT

The undersigned hereby acknowledges receipt of the materials and/or commencement of services described above on behalf of the parties indicated as "GENERATOR/SITE". On behalf of Generator, I hereby make an appoint Emerald Environmental Services Generator's true and lawful agent for the purpose of managing and above waste responsibilities. I understand that this does not relieve Generator of its responsibilities as a generator even though title of the waste transfers to Emerald Environmental Services. Prices quoted herein are subject to waste inspection and acceptance at the destination waste management facility.

BY: \_\_\_\_\_

DATE: \_\_\_\_\_





# LDR NOTIFICATION FORM

Generator Name **SIERRA ZINC MINE**

Manifest No. **004447884FLE**

Pursuant to 40 CFR §268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268 Land Disposal Restrictions (LDR).

## A. GENERAL WASTE NOTIFICATION

Form Line No.	Profile No.	EPA Waste Codes & LDR Subcategories (if any) List codes or use Attachment 1	NWW	WW	UHC Waste Constituent Notification Check the "None" box or List Legend Constituent # or use Attachment 2
1	34900	D005  <input checked="" type="checkbox"/> Check if Attachment 1 has been used	<input checked="" type="checkbox"/>	<input type="checkbox"/>	  <input checked="" type="checkbox"/> None <input type="checkbox"/> Check if Attachment 2 has been used
2		  <input type="checkbox"/> Check if Attachment 1 has been used	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> None <input type="checkbox"/> Check if Attachment 2 has been used
3		  <input type="checkbox"/> Check if Attachment 1 has been used	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> None <input type="checkbox"/> Check if Attachment 2 has been used
4		  <input type="checkbox"/> Check if Attachment 1 has been used	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> None <input type="checkbox"/> Check if Attachment 2 has been used
5		  <input type="checkbox"/> Check if Attachment 1 has been used	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> None <input type="checkbox"/> Check if Attachment 2 has been used
6		  <input type="checkbox"/> Check if Attachment 1 has been used	<input type="checkbox"/>	<input type="checkbox"/>	  <input type="checkbox"/> None <input type="checkbox"/> Check if Attachment 2 has been used

## B. HAZARDOUS DEBRIS NOTIFICATION

This hazardous debris, as identified above on Line No(s) \_\_\_\_\_ is subject to the alternative treatment standards of 40 CFR §268.45.

The waste contains the following contaminants subject to treatment (check all that apply):

Toxicity characteristic debris  Debris contaminated with listed waste  Cyanide reactive debris

## C. CONTAMINATED SOIL NOTIFICATION & CERTIFICATION

This contaminated soil, as identified above on Line No(s) \_\_\_\_\_ is subject to the alternative treatment standards of 40 CFR §268.49(c).

Complete the following: "I certify under penalty of law that I personally have examined this contaminated soil & it [does/ does not] contain listed hazardous waste & [does / does not] exhibit a characteristic of hazardous waste & [is subject to / complies with] soil treatment standards as provided by §268.49(c) or the universal treatment standards". Note: Constituents subject to treatment are any constituents listed in 40 CFR §268.48 Universal Treatment Standards that are reasonably expected to be present in any given volume of contaminated soil, except fluoride, selenium, sulfides, vanadium & zinc, & are present at concentrations greater than ten times the universal treatment standard.

## D. LAB PACK (INCINERATION) NOTIFICATION & CERTIFICATION

This lab pack, as identified above on Line No(s) \_\_\_\_\_ is subject to the alternative treatment standards of 40 CFR §268.42(c).

"I certify under penalty of law that I personally have examined & am familiar with the waste & that the lab pack contains only wastes that have not been excluded under Appendix IV to 40 CFR Part 268 & that this lab pack will be sent to a combustion facility in compliance with the alternative treatment standards for lab packs at 40 CFR §268.42(c). I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment".

## E. EXTENSIONS & VARIANCES

This waste, as identified above on Line No(s) \_\_\_\_\_ is not prohibited from land disposal & is subject to a deadline extension or variance, e.g., treatability variance, case-by-case extension. Describe below any extension or variance that applies to this waste & include applicable dates:

\_\_\_\_\_  
Generator's Authorized Signature

\_\_\_\_\_  
Name & Title (Printed or Typed)

\_\_\_\_ / \_\_\_\_ / \_\_\_\_  
Date



# LDR ATTACHMENT 1: EPA WASTE CODE LISTING

Note: If this form is necessary for notification purposes, it must be used in conjunction with the Notification form and/or Certification form.

Generator		SIERRA ZINC MINE				Manifest					
Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code
<b>"D" Characteristic Codes</b>											
	D001 ICW		D004		D009 HM (Organic)		D017		D026		D035
	D001 LQ (≥10% TOC)	1	D005		D009 HM (Inorganic)		D018		D027		D036
	D002		D006		D010		D019		D028		D037
	D003 EX		D006 CB		D011		D020		D029		D038
	D003 OR		D007		D012		D021		D030		D039
	D003 RC		D008		D013		D022		D031		D040
	D003 RS		D008 LB		D014		D023		D032		D041
	D003 UO		D009 LM-NRR		D015		D024		D033		D042
	D003 WR		D009 LM-RR		D016		D025		D034		D043
<b>"F" Listed Codes</b>											
	F001		F006		F011		F022		F027		F037
	F002		F007		F012		F023		F028		F038
	F003		F008		F019		F024		F032		F039
	F004		F009		F020		F025		F034		
	F005		F010		F021		F026		F035		
<b>"K" Listed Codes</b>											
	K001		K022		K043		K086		K109		K144
	K002		K023		K044		K087		K110		K145
	K003		K024		K045		K088		K111		K147
	K004		K025		K046		K093		K112		K148
	K005		K026		K047		K094		K113		K149
	K006 AN		K027		K048		K095		K114		K150
	K006 HY		K028		K049		K096		K115		K151
	K007		K029		K050		K097		K116		K156
	K008		K030		K051		K098		K117		K157
	K009		K031		K052		K099		K118		K158
	K010		K032		K060		K100		K123		K159
	K011		K033		K061		K101		K124		K161
	K013		K034		K062		K102		K125		K169
	K014		K035		K069 CS		K103		K126		K170
	K015		K036		K069 NCS		K104		K131		K171
	K016		K037		K071 RR		K105		K132		K172
	K017		K038		K071 NRR		K106 LM-RR		K136		
	K018		K039		K073		K106 LM-NRR		K140		
	K019		K040		K083		K106 HM		K141		
	K020		K041		K084		K107		K142		
	K021		K042		K085		K108		K143		
<b>"P" Listed Codes</b>											
	P001		P012		P024		P038		P049		P064
	P002		P013		P026		P039		P050		P065 NIRR
	P003		P014		P027		P040		P051		P065 LM-IR
	P004		P015		P028		P041		P054		P065 LM-RR
	P005		P016		P029		P042		P056		P065 HM-IRR
	P006		P017		P030		P043		P057		P066
	P007		P018		P031		P044		P058		P067
	P008		P020		P033		P045		P059		P068
	P009		P021		P034		P046		P060		P069
	P010		P022		P036		P047		P062		P070
	P011		P023		P037		P048		P063		P071

Note: The Line #'s are from the Notification Form, not the hazardous waste manifest.



LDR ATTACHMENT 1: EPA WASTE CODE LISTING - PAGE 2 MANIFEST NO.:

Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code	Line #'s	EPA Code
	P072		P087		P097		P110		P122		P196
	P073		P088		P098		P111		P123		P197
	P074		P089		P099		P112		P127		P198
	P075		P092 NIRR		P101		P113		P128		P199
	P076		P092 LM-		P102		P114		P185		P201
	P077		P092 LM-RR		P103		P115		P188		P202
	P078		P092 HM-IRR		P104		P116		P189		P203
	P081		P093		P105		P118		P190		P204
	P082		P094		P106		P119		P191		P205
	P084		P095		P108		P120		P192		
	P085		P096		P109		P121		P194		

"U" Listed Codes

	U001		U045		U089		U133		U174		U221
	U002		U046		U090		U134		U176		U222
	U003		U047		U091		U135		U177		U223
	U004		U048		U092		U136		U178		U225
	U005		U049		U093		U137		U179		U226
	U006		U050		U094		U138		U180		U227
	U007		U051		U095		U140		U181		U228
	U008		U052		U096		U141		U182		U234
	U009		U053		U097		U142		U183		U235
	U010		U055		U098		U143		U184		U236
	U011		U056		U099		U144		U185		U237
	U012		U057		U101		U145		U186		U238
	U014		U058		U102		U146		U187		U239
	U015		U059		U103		U147		U188		U240 (2,4-D)
	U016		U060		U105		U148		U189		U240 (2,4-D)
	U017		U061		U106		U149		U190		Salts)
	U018		U062		U107		U150		U191		U243
	U019		U063		U108		U151 LM-NRR		U192		U244
	U020		U064		U109		U151 LM-RR		U193		U246
	U021		U066		U110		U151 HM		U194		U247
	U022		U067		U111		U152		U196		U248
	U023		U068		U112		U153		U197		U249
	U024		U069		U113		U154		U200		U271
	U025		U070		U114		U155		U201		U278
	U026		U071		U115		U156		U202		U279
	U027		U072		U116		U157		U203		U280
	U028		U073		U117		U158		U204		U328
	U029		U074		U118		U159		U205		U353
	U030		U075		U119		U160		U206		U359
	U031		U076		U120		U161		U207		U364
	U032		U077		U121		U162		U208		U367
	U033		U078		U122		U163		U209		U372
	U034		U079		U123		U164		U210		U373
	U035		U080		U124		U165		U211		U387
	U036		U081		U125		U166		U213		U389
	U037		U082		U126		U167		U214		U394
	U038		U083		U127		U168		U215		U395
	U039		U084		U128		U169		U216		U404
	U041		U085		U129		U170		U217		U408
	U042		U086		U130		U171		U218		U409
	U043		U087		U131		U172		U219		U410
	U044		U088		U132		U173		U220		U411

Note: The Line #'s are from the Notification Form, not the hazardous waste manifest.



# LDR ATTACHMENT 2: UHC WASTE CONSTITUENT NOTIFICATION

Note: If this form is necessary for notification purposes, it must be used in conjunction with the Notification form and/or Certification form.

Generator			Manifest		
<b>LDR Inorganic Constituents (40 CFR §268.48)</b>					
Line #'s	Constituent	Legend #	Line #'s	Constituent	Legend #
	Antimony	246		Cyanides (Total)	252
	Arsenic	247		Cyanides (Amenable)	253
	Barium	248		Fluoride <sup>1</sup>	254
	Beryllium	249		Lead	255
	Cadmium	250		Mercury - NWW from Retort	256
	Chromium (Total)	251		Mercury - All others	257
				Nickel	258
				Selenium <sup>1</sup>	259
				Silver	260
				Sulfide <sup>1</sup>	261
				Thallium	262
				Vanadium <sup>1</sup>	263
				Zinc	298
<b>LDR Organic Constituents (40 CFR §268.48)</b>					
Line #'s	Constituent	Legend #	Line #'s	Constituent	Legend #
	Acenaphthene	49		2-sec-Butyl-4,6- dinitrophenol (Dinoseb)	79
	Acenaphthylene	50		Carbaryl *	270
	Acetone	51		Carbenzadim *	271
	Acetonitrile	52		Carbofuran *	272
	Acetophenone	53		Carbofuran phenol *	273
	2-Acetylaminofluorene	54		Carbon disulfide	80
	Acrolein	55		Carbon tetrachloride	81
	Acrylamide *	56		Carbosulfan *	274
	Acrylonitrile	57		Chlordane (alpha & gamma isomers)	82
	Aldicarb sulfone *	265		p-Chloroaniline	83
	Aldrin	58		Chlorobenzene	84
	4-Aminobiphenyl	59		Chlorobenzilate	85
	Aniline	60		2-Chloro-1,3-butadiene	86
	Anthracene	61		Chlorodibromomethane	87
	Aramite	62		Chloroethane	88
	Barban *	266		bis(2- Chloroethoxy) methane	89
	Bendiocarb *	267		bis(2-Chloroethyl)ether	90
	Benomyl *	268		2-Chloroethyl vinyl ether *	94
	Benz(a)anthracene	68		Chloroform	91
	Benzal chloride *	69		bis(2-Chloroisopropyl)ether	92
	Benzene	67		p-Chloro-m-cresol	93
	Benzo(b)fluoranthene	70		Chloromethane (Methyl chloride)	95
	Benzo(k) fluoranthene	71		2-Chloronaphthalene	96
	Benzo(g,h,i) fluoranthene	72		2-Chlorophenol	97
	Benzo(a)pyrene	73		3-Chloropropylene	98
	alpha-BHC	63		Chrysene	99
	beta-BHC	64		o-Cresol	100
	delta-BHC	65		m-Cresol	101
	gamma-BHC	66		p-Cresol	102
	Bromodichloromethane	74		m-Cumenyl methylcarbamate *	275
	Bromomethane (Methyl bromide)	75		Cyclohexanone	103
	4-Bromophenyl phenyl ether	76		o,p'-DDD	108
	n-Butyl alcohol	77		p,p'-DDD	109
	Butyl benzyl phthalate	78		o,p'-DDE	110
	Butylate *	269		p,p'-DDE	111
				o,p'-DDT	112
				p,p'-DDT	113
				Dibenz(a,h)anthracene	114
				Dibenz(a,e)pyrene	115
				1,2-Dibromo-3-chloropropane	104
				1,2-Dibromoethane (Ethylene dihydromide)	105
				Dibromomethane	106
				m-Dichlorobenzene	116
				o-Dichlorobenzene	117
				p-Dichlorobenzene	118
				Dichlorodifluoromethane	119
				1,1-Dichloroethane	120
				1,2-Dichloroethane	121
				1,1-Dichloroethylene	122
				trans-1,2-Dichloroethylene	123
				2,4-Dichlorophenol	124
				2,6-Dichlorophenol	125
				2,4-D (2,4-Dichlorophenoxy-acetic acid)	107
				1,2-Dichloropropane	126
				cis-1,3-Dichloropropylene	127
				trans-1,3-Dichloropropylene	128
				Dieldrin	129
				Diethyl phthalate	130
				p-Dimethylaminoazobenzene *	140
				2,4-Dimethyl phenol	131
				Dimethyl phthalate	132
				Di-n-butyl phthalate	133
				1,4-Dinitrobenzene	134
				4,6-Dinitro-o-cresol	135
				2,4-Dinitrophenol	136
				2,4-Dinitrotoluene	137
				2,6-Dinitrotoluene	138
				Di-n-octyl phthalate	139
				Di-n-propylnitrosamine	141
				1,4-Dioxane	142

<sup>1</sup> Regulated under F039 only; not a UHC \* Constituent not regulated under F039 Note: Line #'s are from the Notification Form, not the hazardous waste manifest.



LDR ATTACHMENT 2: WASTE CONSTITUENT NOTIFICATION - PAGE 2 MANIFEST NO.:

Line #'s	Constituent	Legend #	Line #'s	Constituent	Legend #	Line #'s	Constituent	Legend #
	Diphenylamine	143		Methyl ethyl ketone	184		Physostigmine salicylate *	287
	Diphenylnitrosamine	144		Methyl isobutyl ketone	185		Pronecarb *	288
	1,2-Diphenylhydrazine	145		Methyl methacrylate	186		Pronamide *	218
	Disulfoton	146		Methyl methansulfonate	187		Propham *	289
	Dithiocarbamates (total) *	276		Methyl parathion	188		Propoxur *	290
	Endosulfan I	147		3-Methylcholanthrene	181		Prosulfocarb *	291
	Endosulfan II	148		4,4-Methylene bis(2-chloro-aniline)	182		Pyrene	219
	Endosulfan sulfate	149		Methylene chloride	183		Pyridine	220
	Endrin	150		Metolcarb *	281		Safrole	221
	Endrin aldehyde	151		Mexacarbate *	282		Silvex (2,4,5-TP)	222
	EPTC	277		Molinate *	283		TCDDs (All Tetrachloro-dibenzo-n-dioxins)	225
	2-Ethoxyethanol **	32		Naphthalene	189		TCDFs (All Tetrachloro-dibenzofurans)	226
	Ethyl acetate	152		2-Naphthylamine	190		1,2,4,5-Tetrachlorobenzene	224
	Ethyl benzene	154		o-Nitroaniline *	191		1,1,1,2-Tetrachloroethane	227
	Ethyl cyanide	153		p-Nitroaniline	192		1,1,2,2-Tetrachloroethane	228
	Ethyl ether	155		Nitrobenzene	193		Tetrachloroethylene	229
	Ethyl methacrylate	157		5-Nitro-o-toluidine	194		2,3,4,6-Tetrachlorophenol	230
	Ethylene oxide	158		o-Nitrophenol *	195		Thiodicarb *	292
	bis(2-Ethylhexyl) phthalate	156		p-Nitrophenol	196		Thiophanate-methyl *	293
	Famphur	159		2-Nitropropane **	33		Toluene	231
	Fluoranthene	160		N-Nitrosodiethylamine	197		Toxaphene	232
	Fluorene	161		N-Nitrosodimethylamine	198		Triallate *	294
	Formetanate hydrochloride *	278		N-Nitroso-di-n-butylamine	199		Tribromomethane (Bromofom)	233
	Heptachlor	162		N-Nitrosomethylethylamine	200		2,4,6-Tribromophenol	295
	Heptachlor epoxide	163		N-Nitrosomorpholine	201		1,2,4-Trichlorobenzene	234
	Hexachlorobenzene	164		N-Nitrosopiperidine	202		1,1,1-Trichloroethane	235
	Hexachlorobutadiene	165		N-Nitrosopyrrolidine	203		1,1,2-Trichloroethane	236
	Hexachlorocyclopentadiene	166		Oxamyl *	284		Trichloroethylene	237
	Hexachloroethane	169		Parathion	204		Trichloromonofluoromethane	238
	Hexachloropropylene	170		Total PCBs	205		2,4,5-Trichlorophenol	239
	HxCDDs (All Hexachloro-dibenzo-n-dioxins)	167		Pebulate *	285		2,4,6-Trichlorophenol	240
	HxCDFs (All Hexachloro-dibenzofurans)	168		Pentachlorobenzene	206		2,4,5-T (2,4,5-Trichloro-nhenoxvaccetic acid)	223
	Indeno (1,2,3-c,d) pyrene	171		PeCDDs (All Pentachloro-dibenzo-n-dioxins)	207		1,2,3-Trichloropropane	241
	Iodomethane	172		PeCDFs (All Pentachloro-dibenzofurans)	208		1,1,2-Trichloro-1,2,2-trifluoroethane	242
	Isobutyl alcohol	173		Pentachloroethane *	209		Triethylamine *	296
	Isodrin	174		Pentachloronitrobenzene	210		tris-(2,3-Dibromopropyl)	243
	Isosafrole	175		Pentachlorophenol	211		Vernolate *	297
	Kepone	176		Phenacetin	212		Vinyl chloride	244
	Methacrylonitrile	177		Phenanthrene	213		Xylenes- mixed isomers	245
	Methanol	178		Phenol	214			
	Methapyrilene	179		Phorate	215			
	Methiocarb *	279		Phthalic acid *	216			
	Methomyl *	280		Phthalic anhydride	217			
	Methoxychlor	180		Physostigmine *	286			

\* Constituent not regulated under F039.

\*\* F005 wastes containing no other F001-F005 solvents

Note: Line #'s are from the Notification Form, not the hazardous waste manifest



## **APPENDIX D**

### **Compaction Test Report**



# NORTH CENTRAL TESTING AND INSPECTION

## Construction Materials Testing

83 Copple Road

Omak, WA 98841

Phone: (509) 826-5861 Fax: (509) 826-6039

### DAILY INSPECTION REPORT

DATE: 9/16/2015  
CLIENT: ACI  
PROJECT NO.: 2011-013  
PROJECT: Misc. Testing  
CONTRACTOR: Client

WEATHER	CLEAR	PT. CLOUDY	OVERCAST	RAIN	SNOW
TEMP.	10-32	33-50	51-70	71-85	86+
WIND	STILL	MOD.	HIGH		
HUMIDITY	DRY	MOD.	HUMID		

EQUIPMENT AT SITE: \_\_\_\_\_  
\_\_\_\_\_

4:45am Loaded tools in truck.

5:00am Left office for ACI site in Colville, Wa.

7:42am Arrived on site and met with Keith from ACI. 4 compaction tests were taken at designated points on the project. 85% compaction or better was required. All tests passed with 85% or better compaction.

8:35am Left site.

11:45am Arrived at office.

12:00pm Finished report.

TECHNICIAN: Lewis Adrian PROJECT MGR: T. HAGEMAN PAGE 1 of 1



# NORTH CENTRAL TESTING AND INSPECTION

## Construction Materials Testing

83 Copple Road  
Omak, WA 98841  
Phone: (509) 826-5861 Fax: (509) 826-6039

### SOIL NUCLEAR DENSITY FIELD REPORT

CLIENT :	ACI	PROCTOR NO.	15L-291	GAGE NO.	7
PROJ. NO.:	2011-013	MAX DRY DENSITY (pcf):	128.0	DENS. STD CNT:	2013
PROJECT :	Misc. Testing	OPTIMUM MOIST (%):	9.1	MOIST. STD CNT:	695
CONTRACTOR:	Client	DATE TESTED:	9/16/2015		

LOCATION: Sierra-Zinc Mine  
MATERIAL: Backfill

TEST NO.	TEST MODE	TEST LOCATION	ELEV. FT. or LIFT NO.	FIELD MOIST.	WET DENSITY	DRY DENSITY	PCT. COMP. PROCTOR NO.1	PCT. COMP. PROCTOR NO.2	PCT. REQD.
1	6	See Map For Locations	subgrade	7.2	128.1	119.5	93.4		85.0
2	6	See Map For Locations	subgrade	6.6	122.7	115.1	89.9		85.0
3	6	See Map For Locations	subgrade	5.1	126.7	120.6	94.2		85.0
4	6	See Map For Locations	subgrade	4.5	118.2	113.1	88.4		85.0
5									
6									
7									
8									
9									
10									
11									
12									
13									

REMARKS:

TECHNICIAN: Lewis Adrian      PROJ. MGR: T. HAGEMAN





1A ●

2A ●

3A ●

4A ●

LEGEND

● Geotechnical Sample Locations