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## Early Phase II Removal Site Evaluation Cherryvale, KS

Soil Sample Results: Cherryvale Unified School District 447  
Former McKinley School, Lincoln Elementary School,  
Cherryvale Middle/High School

Prepared for:  
Kansas Department of Health and Environment

Prepared by:  
Project Navigator, Ltd.  
10497 Town & Country Way Suite 830  
Houston, TX 77024

On behalf of United States Steel Corporation and  
Citigroup Global Market Holdings, Inc., Respondents in  
Consent Order Case No. 03-E-0222, as amended (the  
"Respondents")

August 2014 revised



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## 1.0 Introduction

This report summarizes work performed for residential soil screening for lead at three school properties in Cherryvale, Kansas: Former McKinley School, Lincoln Elementary School, and Cherryvale Middle/High School. At the request of Kansas Department of Health and Environment, (KDHE) this work was performed early, prior to the resumption of fall classes, as part of ongoing activities outlined in the Phase II Removal Site Evaluation (RSE) Work Plan, National Zinc Site, Cherryvale, Kansas (Draft dated June 27, 2014).

Work was performed August 4 through August 8, 2014. The work was performed by Project Navigator, Ltd. under the supervision of Mark Landress, Kansas Licensed Professional Geologist No. 793 on behalf of the Respondents. Holly Burke of KDHE observed the sampling work.

## 2.0 Background Information and Site Description

The subject properties are within the city of Cherryvale, and are located south and east of the former National Zinc Smelter. (Figure 1). The history and details of the facility are documented in various site reports which are on file at the KDHE and discussed in the RSE Work Plan.

The school properties consist of buildings, playgrounds, parking lots, ball fields and surrounding landscape. The following table briefly describes the building and area features.

Property	Building	Occupancy	Site Description	Smelter Material
Former McKinley School (Figure 2)	Brick with concrete slab.	In Use	Ball / soccer field to north. Wood chip covered play area adjacent to building on south. Stone / asphalt parking area and grass covered open space to east. Tree and grass covered area west.	Isolated SRM retort fragment in northeast quadrant at 12 inches below ground surface. SRM granular material observed in southwest quadrant in small animal burrow adjacent to concrete sidewalk.
Lincoln Elementary (Figure 3)	Brick with concrete slab.	In Use	Grass and landscape elevated from road on west, north and east. Asphalt parking lot, southeast. Wood chip play area on south. Grass covered playground / ball field on southwest. Stone and concrete retaining wall with fill between wall and building surrounding property. Painted concrete and peeling paint noted south and southwest side of building.	Isolated SRM retort fragment west side by air conditioners. Isolated SRM retort fragment northeast by building entrance. Red granular soils of possible SRM origin on east side by dumpster. Note: non-smelter related chat fragments observed west side by tree near steps.
Cherryvale MS/High School (Figures 4 and 5)	Brick with concrete slab, detached outbuilding.	In Use	Grass with landscape northwest, northeast and east. Isolated grass landscape next to building. Asphalt parking lot and grass covered ball field to south. Recent excavation for drainage line north side. Recent radio tower install with concrete footings north side.	Isolated SRM retort fragment southeast corner of building under trees. Isolated SRM fragments in ditch directly north of circular driveway on east side.

## 3.0 Field Procedure

Utility clearances were obtained through Kansas One-Call which was marked prior to sampling. Access agreements had been previously obtained from the Cherryvale USD 447. Contact was also made with Randy Wagner, Superintendent notifying him of the activities.

Properties were divided roughly in quarters and between 3 and 5 sample aliquot points selected for each quarter or area selected for composite sampling. Aliquots were reduced from 5 points for narrow land strips of limited area. Soil samples were collected at locations following generally guidelines in EPA OSWER 9285.7-50 Superfund Lead-Contaminated Residential Sites Handbook as amended and the RSE Work Plan. Each sample point was laid out on aerial photos and property maps with a sample designation consisting of a location code or address, sample composite identifier, aliquot and depth.

Sample locations were staked on August 4, 2014. Samples at each aliquot point were collected at 6-inch depth intervals below ground surface using hand augers to a maximum depth of 18 inches. Each 6-inch sample horizon was denoted as A, B, C for the 0-6", 6-12", and 12-18" depth respectively. Samples were individually bagged in Zip-Lock bags, labeled with the sample number and location and depth. Sample equipment was cleaned with soap and water and rinsed with distilled water before moving onto the next sample point.

Presence of any potential smelter-related material was noted during the inspection of the property for SRM classification as outlined in the Work Plan. Each area was photographed and notes regarding the samples and other activities or features recorded in the field log.

Following collection of the sample, excess soil was placed back in the auger hole and the holes collapsed and loose soil compacted. Additional clean soil added to level the hole to grade.

#### **4.0 Sample Preparation**

For composite samples, equal quantities of sample aliquots were removed from each sample bag and placed in a clean stainless steel mixing bowl and homogenized with a clean trowel. The homogenized samples were then sieved with a 10 mesh screen sieve and air dried with the minus 10 mesh soil transferred to a plastic bag for field XRF analysis. Sample tools and screens were cleaned after each composite and the process repeated for the next sample until all samples were completed.

#### **5.0 X-Ray Instrumentation**

All samples were screened in the field laboratory for lead using a Thermo Niton XL3t X-ray fluorescence analyzer (XRF). The instrument was initially factory calibrated prior to use and it employs an internal standardization plate which checks detector resolution and peak function. The instrument standardization is performed on start-up and periodically thereafter. The internal software will inhibit the instrument if the unit does not pass one or more internal checks during standardization. Duplicate analysis on individual samples, laboratory cross-check and internal calibration comprised the instrument operational check for the work. NIST standards and duplicate analyses were used to check the reproducibility of the instrument in the field. The instrument operators hold X-ray radiation safety training certificates and Project Navigator Ltd., holds a 2014 KDHE BEH Radiation and Asbestos Control Section Certificate of Registration No. 7192 to operate XRF analyzers in the State of Kansas.

A single 1-minute XRF reading was taken for each homogenized sample composite with duplicate readings taken periodically. The data was recorded in the instrument data logger and visually checked on the instrument display to ensure proper instrument function. Data was transcribed from the data logger and extracted as data tables for display.

## **6.0 XRF Screening Results**

All composites were below the lead screening threshold of 400 mg/kg except for the sample at the southwest quadrant of former McKinley School Sample MS-5B, at a depth of 6-12 inches below ground surface. (Figure 2) Average XRF screening sample results for 4 readings taken on the sieved composite at this location and depth is 445.8 mg/kg lead. This was the only soil composite collected which exceeded the soil screening limit and as noted, this sample was from the 6-12 inch depth, covered by 6 inches of soil that is below the screening threshold.

Figures 2 through 5 show the school properties, sample locations, SRM observations and any soil exceedances. Sample results and depth for any composites over the screening limit of 400 mg/kg for lead are highlighted. The individual soil screening data is presented in Table 1.

At the former McKinley School, small area approximately 12 inches in diameter with granular SRM was observed next to the west walkway which was apparently uncovered by a small animal burrow. A grab sample of the granular SRM shows elevated lead which is not representative of average soil concentrations. The location is shown in Figure 2.

## **7.0 Laboratory Analytical Cross Check**

Three laboratory sample splits for QA/QC were collected. Analysis was performed by Pace Analytical Laboratories. The results are depicted in Table 1. Laboratory results show lower values for lead for samples HS-3A and LE-4A. Laboratory results are higher than the average lead value for sample MS-5B but it is within the range of the duplicate XRF analysis. Variations between laboratory and field XRF results are common. Additional QA/QC will be performed as per the work plan and are not included in this summary report.

## **8.0 Sample Disposition**

Sample splits for all samples were retained for further analysis if needed.

# FIGURES

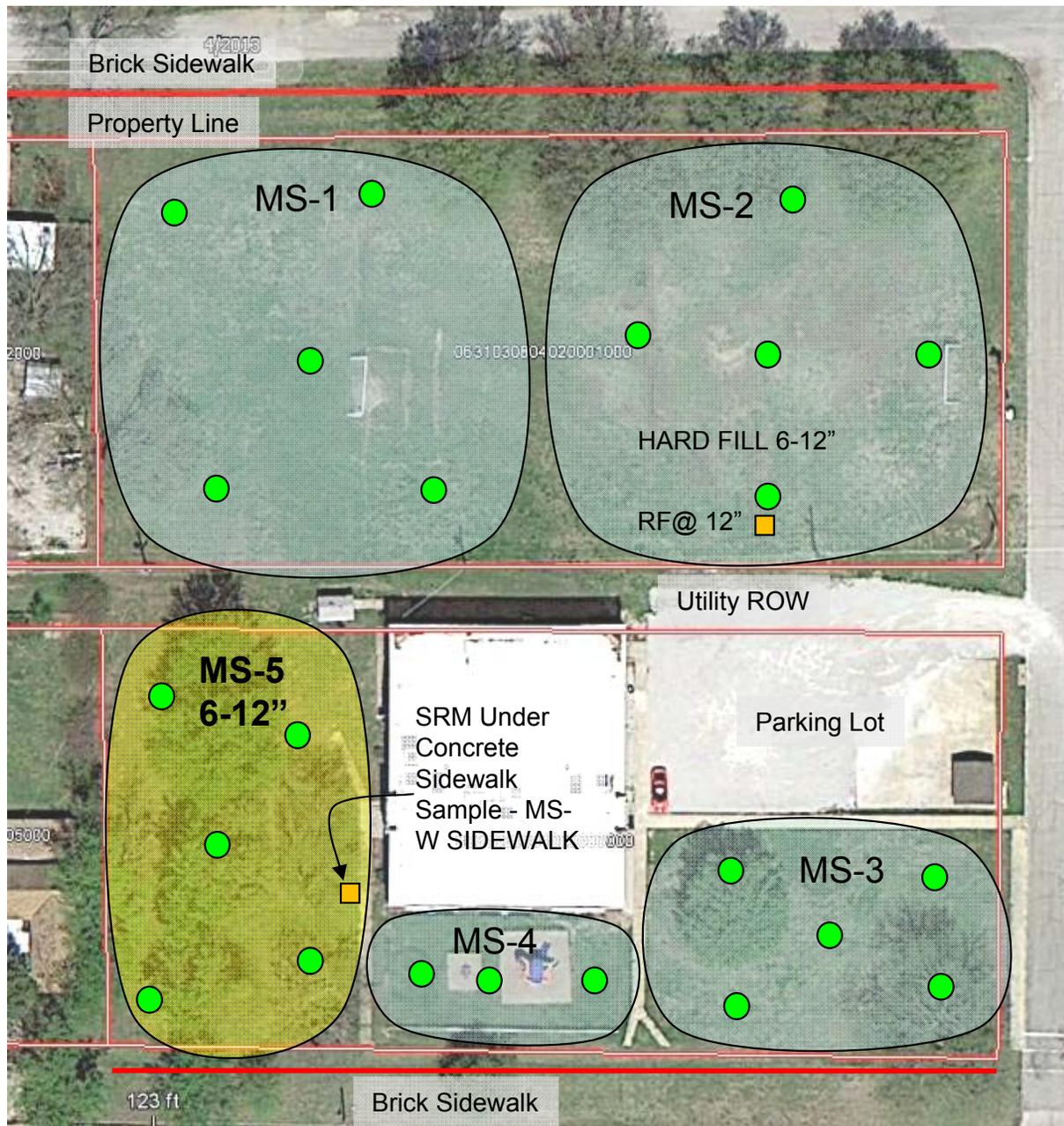


Phase II Removal Site Evaluation, Cherryvale, Kansas

Figure 1

Cherryvale USD Surveyed School Locations





**Legend**

- Observed SRM**  
 RF-Retort Fragment  
 GR-Granular
- Sample Aliquot
- Composite Sample  
 <400 mg/kg Pb
- Composite Sample  
 >400 mg/kg Pb with  
 exceedance depth
- Property Line
- Ditch or Sidewalk



125 feet

Phase II Removal Site Evaluation, Cherryvale, Kansas

Figure 2

Former Mckinley School

August 2014





Legend

- Observed SRM**
- RF-Retort Fragment  
GR-Granular
  - Sample Aliquot
  - Composite Sample  
<400 mg/kg Pb
  - Composite Sample  
>400 mg/kg Pb with  
exceedance depth
  - Property Line
  - Ditch or Sidewalk
- N  
↑  
150'

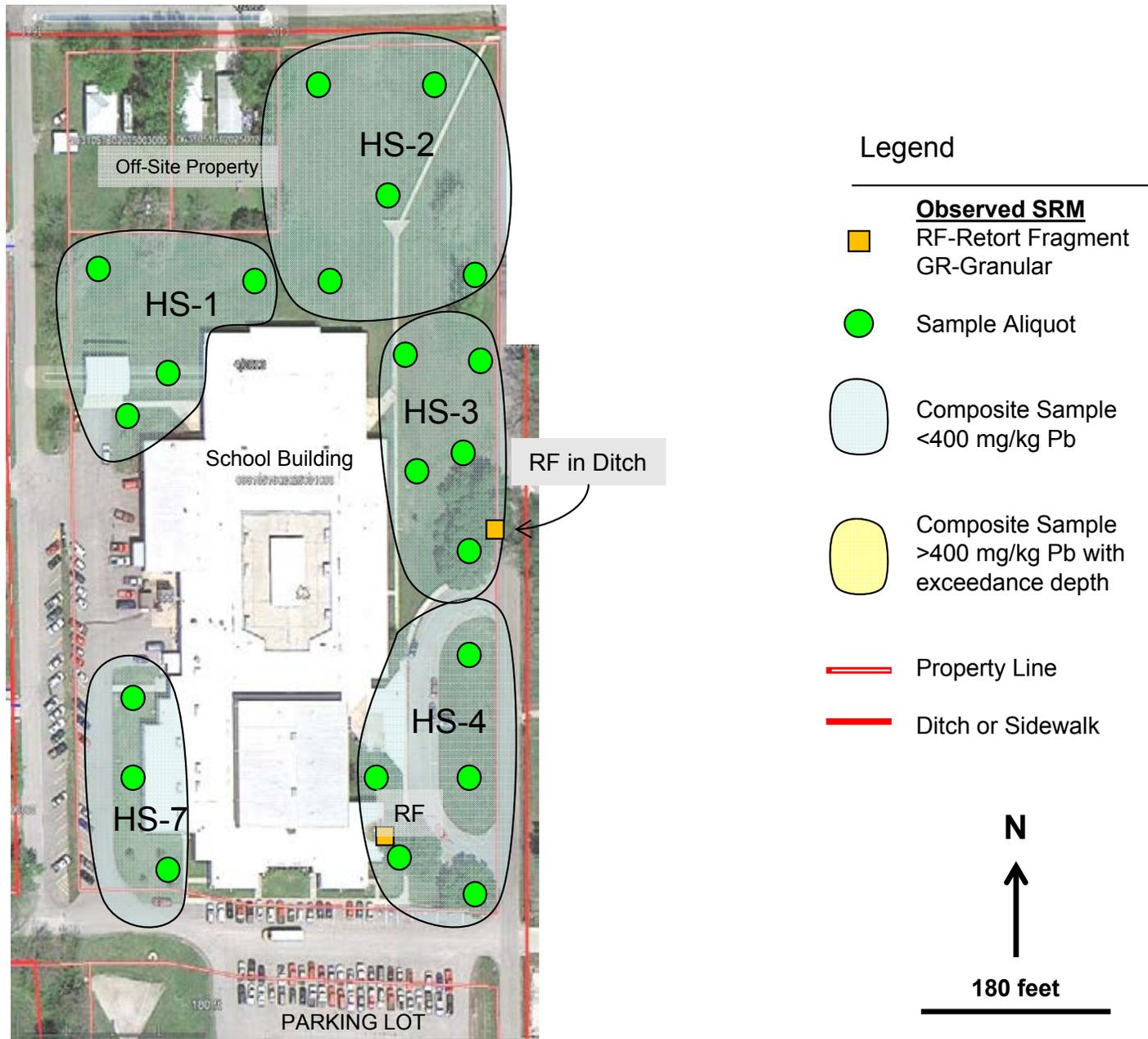
Phase II Removal Site Evaluation, Cherryvale, Kansas

Figure 3

Lincoln Elementary School

August 2014





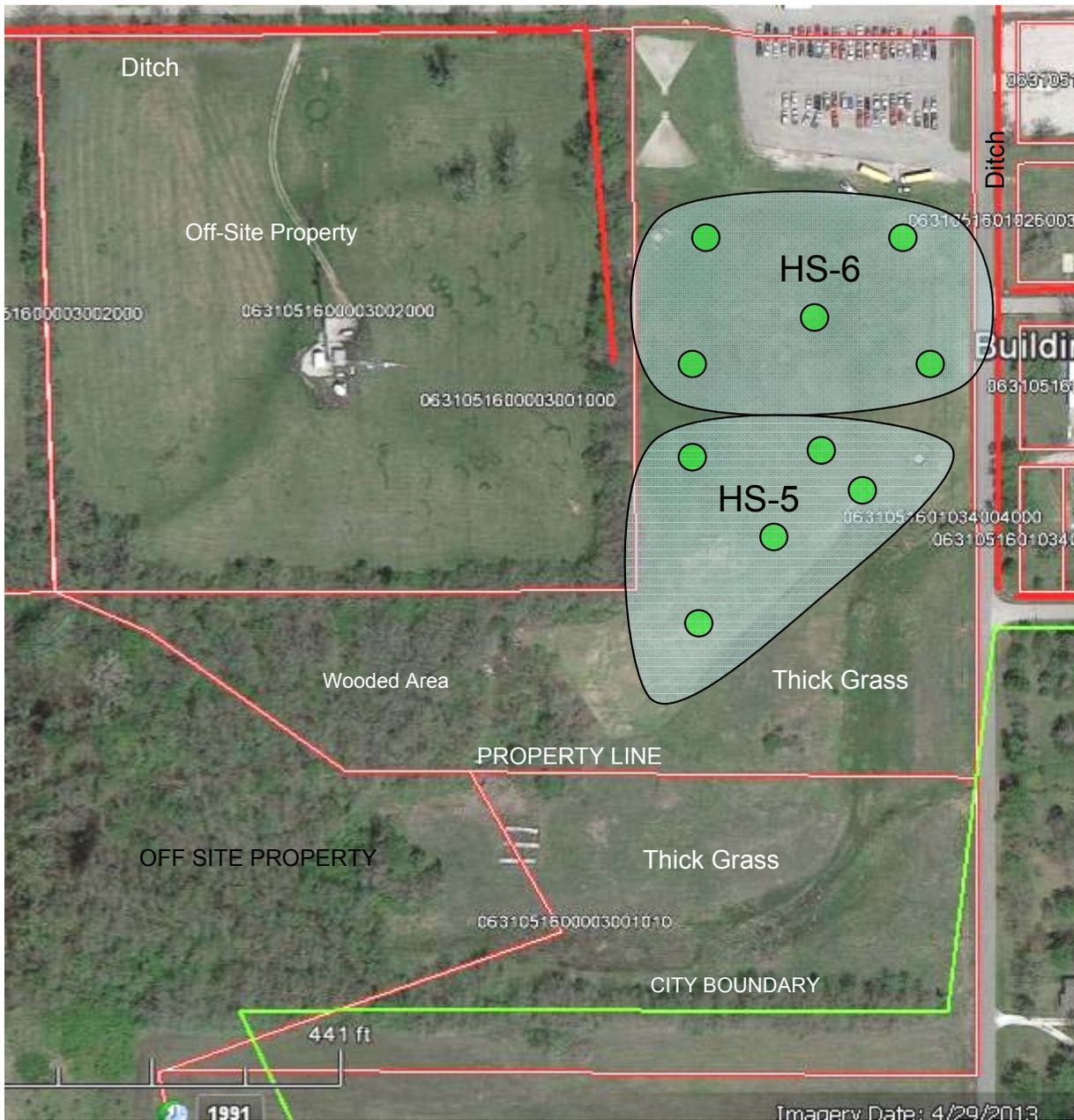
Phase II Removal Site Evaluation, Cherryvale, Kansas

Figure 4

Cherryvale High School North Property

August 2014





Legend

- Observed SRM**
- RF-Retort Fragment  
GR-Granular
  - Sample Aliquot
  - Composite Sample  
<400 mg/kg Pb
  - Composite Sample  
>400 mg/kg Pb with  
exceedance depth
  - Property Line
  - Ditch or Sidewalk



450 feet

Phase II Removal Site Evaluation, Cherryvale, Kansas

Figure 5

Cherryvale High School South Property

August 2014



# TABLES

## Table 1

### Soil Composite Analysis

**TABLE 1 - Cherryvale USD XRF Soil Composite Analysis**

Reading No	SAMPLE	Pb	Pb +/-	Laboratory Confirmation	Units	Relative Percent Difference	Location	Type
1	HS-1A	86.0	11.5		mg/kg		Cherryvale High School	Soil Composite
2	HS-1B	70.6	10.4		mg/kg		Cherryvale High School	Soil Composite
3	HS-1C	56.1	9.9		mg/kg		Cherryvale High School	Soil Composite
4	HS-2A	98.7	11.9		mg/kg		Cherryvale High School	Soil Composite
5	HS-2B	44.7	8.9		mg/kg		Cherryvale High School	Soil Composite
6	HS-2C	44.0	8.9		mg/kg		Cherryvale High School	Soil Composite
7	HS-3A	68.6	10.3		mg/kg		Cherryvale High School	Soil Composite
8	HS-3A DUP	73.1	10.7		mg/kg		Cherryvale High School	Soil Composite
9	HS-3A DUP	69.8	10.4		mg/kg		Cherryvale High School	Soil Composite
10	HS-3A Average	70.5		53.3	mg/kg	32.3	Cherryvale High School	Soil Composite
11	HS-3B	53.8	9.5		mg/kg		Cherryvale High School	Soil Composite
12	HS-3C	56.6	9.5		mg/kg		Cherryvale High School	Soil Composite
13	HS-4A	96.1	11.7		mg/kg		Cherryvale High School	Soil Composite
14	HS-4B	74.6	10.5		mg/kg		Cherryvale High School	Soil Composite
15	HS-4C	71.8	10.6		mg/kg		Cherryvale High School	Soil Composite
16	HS-4C DUP	76.0	11.0		mg/kg		Cherryvale High School	Soil Composite
17	HS-4C DUP	64.8	10.3		mg/kg		Cherryvale High School	Soil Composite
18	HS-5A	100.2	11.8		mg/kg		Cherryvale High School	Soil Composite
19	HS-5B	76.3	10.6		mg/kg		Cherryvale High School	Soil Composite
20	HS-5C	221.5	17.1		mg/kg		Cherryvale High School	Soil Composite
21	HS-5C DUP	164.3	15.1		mg/kg		Cherryvale High School	Soil Composite
22	HS-6A	83.2	11.0		mg/kg		Cherryvale High School	Soil Composite
23	HS-6B	71.3	10.6		mg/kg		Cherryvale High School	Soil Composite
24	HS-6C	76.9	10.8		mg/kg		Cherryvale High School	Soil Composite
25	HS-7A	100.6	11.9		mg/kg		Cherryvale High School	Soil Composite
26	HS-7B	111.5	12.6		mg/kg		Cherryvale High School	Soil Composite
27	HS-7C	58.8	10.7		mg/kg		Cherryvale High School	Soil Composite
28	LE-1A	185.3	15.5		mg/kg		Lincoln Elementary	Soil Composite
29	LE-1B	134.7	13.6		mg/kg		Lincoln Elementary	Soil Composite
30	LE-1C	145.2	13.8		mg/kg		Lincoln Elementary	Soil Composite
31	LE-2A	176.1	15.3		mg/kg		Lincoln Elementary	Soil Composite
32	LE-2B	171.1	12.7		mg/kg		Lincoln Elementary	Soil Composite
33	LE-2B DUP	238.6	17.5		mg/kg		Lincoln Elementary	Soil Composite
34	LE-2B DUP	177.1	12.9		mg/kg		Lincoln Elementary	Soil Composite
35	LE-2C	208.8	16.3		mg/kg		Lincoln Elementary	Soil Composite
36	LE-3A	192.3	16.4		mg/kg		Lincoln Elementary	Soil Composite
37	LE-3A DUP	221.2	17.8		mg/kg		Lincoln Elementary	Soil Composite
38	LE-3B	170.2	15.2		mg/kg		Lincoln Elementary	Soil Composite
39	LE-3C	83.0	11.2		mg/kg		Lincoln Elementary	Soil Composite
40	LE-4A	119.3	13.0	74.0	mg/kg	61.3	Lincoln Elementary	Soil Composite
41	LE-4B	39.6	9.2		mg/kg		Lincoln Elementary	Soil Composite
42	LE-4C	77.7	11.7		mg/kg		Lincoln Elementary	Soil Composite
43	LE-5A	92.0	11.5		mg/kg		Lincoln Elementary	Soil Composite
44	LE-5B	126.8	13.3		mg/kg		Lincoln Elementary	Soil Composite
45	LE-5B DUP	122.5	13.0		mg/kg		Lincoln Elementary	Soil Composite
46	LE-5B DUP	128.5	13.2		mg/kg		Lincoln Elementary	Soil Composite
47	LE-5C	164.3	14.9		mg/kg		Lincoln Elementary	Soil Composite
48	MS-1A	209.5	17.3		mg/kg		McKinley School	Soil Composite
49	MS-1B	116.4	12.6		mg/kg		McKinley School	Soil Composite
50	MS-1C	48.8	9.4		mg/kg		McKinley School	Soil Composite
51	MS-2A	205.2	14.2		mg/kg		McKinley School	Soil Composite
52	MS-2B	280.3	16.5		mg/kg		McKinley School	Soil Composite
53	MS-2C	127.1	13.4		mg/kg		McKinley School	Soil Composite
54	MS-3A	136.7	13.6		mg/kg		McKinley School	Soil Composite
55	MS-3B	61.4	10.1		mg/kg		McKinley School	Soil Composite
56	MS-3C	77.4	10.9		mg/kg		McKinley School	Soil Composite
57	MS-4A	59.7	9.9		mg/kg		McKinley School	Soil Composite
58	MS-4B	77.0	10.9		mg/kg		McKinley School	Soil Composite
59	MS-4C	141.7	14.5		mg/kg		McKinley School	Soil Composite
60	MS-5A	164.4	15.6		mg/kg		McKinley School	Soil Composite
61	MS-5B	628.7	23.9		mg/kg		McKinley School	Soil Composite
62	MS-5B DUP	437.6	19.7		mg/kg		McKinley School	Soil Composite
63	MS-5B DUP	298.5	16.5		mg/kg		McKinley School	Soil Composite
64	MS-5B DUP	418.6	19.4		mg/kg		McKinley School	Soil Composite
65	MS-5B Average	445.8		561.0	mg/kg	-20.5	McKinley School	Soil Composite
66	MS-5C	118.2	12.9		mg/kg		McKinley School	Soil Composite
67	MS-W Sidewalk	2221.5	90.0		mg/kg		McKinley School	Non-representative SRM Grab
68	MS-W Sidewalk DUP	2779.8	106.8		mg/kg		McKinley School	Non-representative SRM Grab

**ATTACHMENT 1**  
**Laboratory Reports**

August 19, 2014

Mark Landress  
Project Navigator, Ltd.  
10497 Town and Country Way  
Suite 830  
Houston, TX 77024

RE: Project: NATIONAL ZINC  
Pace Project No.: 60175434

Dear Mark Landress:

Enclosed are the analytical results for sample(s) received by the laboratory on August 08, 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,



Jamie Church  
jamie.church@pacelabs.com  
Project Manager

Enclosures

cc: Philip Jen, Project Navigator, Ltd.



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: NATIONAL ZINC

Pace Project No.: 60175434

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #40770

Alabama Certification #40770

Alaska Certification #: UST-078

Alaska Certification #MN00064

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 #: Pace

Georgia Certification #: 959

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

Nebraska Certification #: Pace

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

Wisconsin Certification #: 999407970

West Virginia Certification #: 382

West Virginia DHHR #:9952C

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## SAMPLE SUMMARY

Project: NATIONAL ZINC

Pace Project No.: 60175434

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
60175434001	MS-5B	Solid	08/07/14 11:40	08/08/14 08:40
60175434002	LE-4A	Solid	08/07/14 11:45	08/08/14 08:40
60175434003	HS-3A	Solid	08/07/14 11:57	08/08/14 08:40

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### SAMPLE ANALYTE COUNT

Project: NATIONAL ZINC

Pace Project No.: 60175434

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60175434001	MS-5B	EPA 6020	AJM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
60175434002	LE-4A	EPA 6020	AJM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M
60175434003	HS-3A	EPA 6020	AJM	1	PASI-M
		ASTM D2974	JDL	1	PASI-M

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### ANALYTICAL RESULTS

Project: NATIONAL ZINC

Pace Project No.: 60175434

**Sample: MS-5B**      **Lab ID: 60175434001**      Collected: 08/07/14 11:40      Received: 08/08/14 08:40      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						
Lead	<b>561</b>	mg/kg	0.50	100	08/18/14 14:05	08/19/14 09:28	7439-92-1	M6
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>12.6</b>	%	0.10	1		08/15/14 00:00		

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## ANALYTICAL RESULTS

Project: NATIONAL ZINC

Pace Project No.: 60175434

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**Sample: LE-4A**      **Lab ID: 60175434002**      Collected: 08/07/14 11:45      Received: 08/08/14 08:40      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						
Lead	<b>74.0</b>	mg/kg	0.10	20	08/18/14 14:05	08/18/14 17:49	7439-92-1	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>8.1</b>	%	0.10	1		08/15/14 00:00		

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### ANALYTICAL RESULTS

Project: NATIONAL ZINC

Pace Project No.: 60175434

**Sample: HS-3A**      **Lab ID: 60175434003**      Collected: 08/07/14 11:57      Received: 08/08/14 08:40      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						
Lead	<b>53.3</b>	mg/kg	0.10	20	08/18/14 14:05	08/18/14 17:52	7439-92-1	
<b>Dry Weight</b>		Analytical Method: ASTM D2974						
Percent Moisture	<b>18.9</b>	%	0.10	1		08/15/14 00:00		

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### QUALITY CONTROL DATA

Project: NATIONAL ZINC

Pace Project No.: 60175434

QC Batch: MPRP/48299 Analysis Method: EPA 6020  
 QC Batch Method: EPA 3050 Analysis Description: 6020 MET  
 Associated Lab Samples: 60175434001, 60175434002, 60175434003

METHOD BLANK: 1762702 Matrix: Solid

Associated Lab Samples: 60175434001, 60175434002, 60175434003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	mg/kg	ND	0.093	08/18/14 17:28	

LABORATORY CONTROL SAMPLE: 1762703

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	mg/kg	19.2	20.2	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1762704 1762705

Parameter	Units	1762704		1762705		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60175434001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Lead	mg/kg	561	18.3	18.8	500	515	-333	-249	75-125	3	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.

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### QUALITY CONTROL DATA

Project: NATIONAL ZINC

Pace Project No.: 60175434

QC Batch: MPRP/48278

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 60175434001, 60175434002, 60175434003

SAMPLE DUPLICATE: 1762134

Parameter	Units	10277014003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	22.6	23.4	3	30	

SAMPLE DUPLICATE: 1762135

Parameter	Units	10277606001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.6	21.7	0	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.

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## QUALIFIERS

Project: NATIONAL ZINC

Pace Project No.: 60175434

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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.

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: NATIONAL ZINC

Pace Project No.: 60175434

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60175434001	MS-5B	EPA 3050	MPRP/48299	EPA 6020	ICPM/21329
60175434002	LE-4A	EPA 3050	MPRP/48299	EPA 6020	ICPM/21329
60175434003	HS-3A	EPA 3050	MPRP/48299	EPA 6020	ICPM/21329
60175434001	MS-5B	ASTM D2974	MPRP/48278		
60175434002	LE-4A	ASTM D2974	MPRP/48278		
60175434003	HS-3A	ASTM D2974	MPRP/48278		

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Sample Condition Upon Receipt

WO#: 60175434



60175434

Client Name: Project Navigator

Courier: Fed Ex [X] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other [ ]

Tracking #: 7801 0472 5225 Pace Shipping Label Used? Yes [ ] No [X]

Custody Seal on Cooler/Box Present: Yes [X] No [ ] Seals intact: Yes [X] No [ ]

Packing Material: Bubble Wrap [X] Bubble Bags [ ] Foam [ ] None [ ] Other [ ]

Thermometer Used: T-239 / T-194 Type of Ice: Wet [X] Blue [ ] None [ ] Samples received on ice, cooling process has begun.

Cooler Temperature: 5.2  
Temperature should be above freezing to 6°C

Date and initials of person examining contents: [Signature] 8/8/14 [Signature]

Table with 17 rows and 2 columns. Row 1: Chain of Custody present: [X] Yes [ ] No [ ] N/A 1. Row 2: Chain of Custody filled out: [X] Yes [ ] No [ ] N/A 2. Row 3: Chain of Custody relinquished: [X] Yes [ ] No [ ] N/A 3. Row 4: Sampler name & signature on COC: [X] Yes [ ] No [ ] N/A 4. Row 5: Samples arrived within holding time: [X] Yes [ ] No [ ] N/A 5. Row 6: Short Hold Time analyses (<72hr): [ ] Yes [X] No [ ] N/A 6. Row 7: Rush Turn Around Time requested: [ ] Yes [X] No [ ] N/A 7. Row 8: Sufficient volume: [X] Yes [ ] No [ ] N/A 8. Row 9: Correct containers used: [X] Yes [ ] No [ ] N/A 9. Row 10: Pace containers used: [X] Yes [ ] No [ ] N/A 10. Row 11: Containers intact: [X] Yes [ ] No [ ] N/A 11. Row 12: Unpreserved 5035A soils frozen w/in 48hrs? [ ] Yes [ ] No [X] N/A 12. Row 13: Filtered volume received for dissolved tests? [ ] Yes [ ] No [X] N/A 13. Row 14: Sample labels match COC: [X] Yes [ ] No [ ] N/A 14. Row 15: Includes date/time/ID/analyses Matrix: soil 15. Row 16: All containers needing preservation have been checked. [ ] Yes [ ] No [X] N/A 16. Row 17: All containers needing preservation are found to be in compliance with EPA recommendation. [ ] Yes [ ] No [X] N/A 17. Row 18: Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics [X] Yes [ ] No Initial when completed [Signature] Lot # of added preservative [ ] Row 19: Trip Blank present: [ ] Yes [ ] No [X] N/A Row 20: Pace Trip Blank lot # (if purchased): [Signature] 15. Row 21: Headspace in VOA vials (>6mm): [ ] Yes [ ] No [X] N/A 16. Row 22: Project sampled in USDA Regulated Area: [ ] Yes [ ] No [X] N/A 17. List State:

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

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

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

Project Manager Review: [Signature] Date: 8/11/14



ATTACHMENT 2  
Field Note Summary

## Early Phase II Removal Site Evaluation, Cherryvale, Kansas

### Field Note Summary

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Date / Time	Description
7/25/2014	Friday: MRL. Call utility locates for Mckinley School, Lincoln Elementary, CV HS/MS
8/4/2014	Monday: Crew: MRL, PJ Weather: Hot, clear
800-1300	Mobilize to Cherryvale. Prepare for field work
1300-1700	M. Landress and P. Jen stake sample locations for field work
1300-1400	Lay out sample locations McKinley School.
1400-1500	Lay out sample locations at Lincoln Elementary. Note SRM fragment W side by AC units.
1500-1700	Lay out sample locations at Cherryvale High School. SRM fragment noted E side in ditch by turnaround.
1700	Complete work for day. Procure equipment and materials for sampling.
8/5/2014	Tuesday: Crew: MRL, PJ, JA, CJ, BD, ML; Weather - hot, clear
700-1000	Meet at field office in Cherryvale. Perform safety meeting with crew. Mobilize for first sampling
1000-1300	Field sampling at McKinley Elementary. Start north side in soccer field. End SW quadrant. SRM fragment noted subsurface NE quadrant south side at 12 inches. Refusal. Granular SRM 1' wide exposed by animal burrow noted west at edge of sidewalk.
1400-1600	Field sampling at Lincoln Elementary. Start west side. Fill soil and debris noted in auger holes behind retaining wall. Soil fill noted west and north side behind retaining wall. SRM fragment northeast side in bushes by corner entrance. Red granular material observed west side by dumpster. Possible fill southwest quadrant behind stone wall. Brick sidewalk noted southwest side outside of retaining wall. Peeling paint noted on building eaves southwest side.
1600-1700	Return samples to field office. Dry and sieve samples for analysis.
8/6/2014	Wednesday: Crew: MRL, PJ, JA, CJ, BD, ML: Weather: hot, clear
700-730	Meet at field office in Cherryvale. Perform safety meeting with crew. Layout work for day.
730-830	Sample Cherryvale MS/HS starting north side. Proceed until start of school registration. SRM retort fragment noted SE corner adjacent to building under tree. Retort fragment observed east side in ditch north of circular drive. Other soil normal appearance.
830-1600	Sample processing and XRF analysis. Dry and sieve samples at field office
1600-1830	Crew samples remaining locations at Cherryvale MS/HS. Return samples to field office for processing. Continue XRF analysis of sieved samples. Prepare soil descriptions.
8/7/2014	Thursday: Crew: MRL, PJ, JA, CJ, BD, ML: Weather: hot, clear
0700-0800	Meet at field office in Cherryvale. Perform safety meeting with crew. Layout work for day.
0800-1600	Sample processing. Dry, sieve and analyze samples. Crew backfill sample holes, pull pin flags.
8/8/2014	Thursday: Crew: MRL, PJ, JA, CJ, BD, ML: Weather: hot, clear
0700-1100	Complete paperwork and mapping info for sampling.
1100	Demobilize crew.

Crew: MRL - Mark Landress JA- Jason Adkison BD- Brody Dean  
PJ - Phil Jen CJ- Carl Johnson ML- Matt Linn