Integrated Assessment Report
Caney Smelter Complaint

Kansas
Department of Health
and Environment

March, 2015
C3-063-72810
EPA I.D. Number KSN000706287

Prepared by:

Kansas Department of Health and Environment
Division of Environment
Bureau of
Curtis State Office Building
1000 Jackson St,
Topeka KS, 66612

FINAL

INTEGRATED ASSESSMENT

Caney Smelter Complaint

Caney, Kansas

Prepared by:
Kansas Department of Health and Environment
Bureau of Environmental Remediation
Remedial Section
Site Assessment Program

Date: March 2015

State ID: C3-063-72810
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Project Manager: Randolph L. Brown, P.G., Site Assessment Unit Chief

Project Team Members:
Nicholas Schneider, Environmental Scientist

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1.0 Introduction

This document presents the findings of an Integrated Assessment (IA) conducted by the Kansas Department of Health and Environment (KDHE) to verify if a release of hazardous substances, pollutants or contaminants has occurred at the Caney Smelter Complaint site in Caney, Montgomery County, Kansas. This assessment was conducted as part of continuing cooperative agreement with the U.S. Environmental Protection Agency (EPA) to perform investigations of selected sites to evaluate potential or actual releases of hazardous substances, pollutants, or contaminants in Kansas. These investigations are performed under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 CFR § 300. The purpose of this IA is to collect additional data to support a site disposition for the Caney Smelter Complaint site.

2.0 Site Description and Location

The Caney Smelter Complaint site is located at 811 North Cedar Street, Caney, Montgomery County, Kansas 67333. The site is the former location of the Cheyenne Window Glass Company and the Fredonia Window Glass Company. The legal description is the northwest quarter of Section 7, Township 35 South, Range 14 East. Global positioning system coordinates for the site are approximately -95.92101 decimal degrees west longitude and 37.02056 decimal degrees north latitude. The site has been owned by Mr. Larry Layton for several decades for use as residential property and to raise hogs (Reference 1).

3.0 Site Background

3.1 History

The January 1912 Sanborn Fire Insurance Map indicates the site property as the "Cheyenne Window Glass Company" located along the southern side of the same rail spur connecting the adjacent American Zinc, Lead, and Smelting Company (AZLS). The 1917 Sanborn Map shows the property as the "Fredonia Window Glass Company." The 1927 Sanborn Map indicates both the glass plant property and the adjacent AZLS as being inactive (Reference 2). According to *A Standard History of Kansas and Kansas*, 1918, the Fredonia Window Glass Company acquired the American Vitrified Brick Company facility about 1914-1915 and also operated glass plants in both Caney and Fredonia, Kansas (Reference 3). Very little historical information is available regarding the operational history of the former glass plants on the Layton property. North of the abandoned rail spur forming the northern boundary of the site was the former American

Vitrified Brick Company works (Reference 2). No historical information was located for the former American Vitrified Brick Company.

3.2 Previous Investigations

The former AZLS site has been extensively assessed as the American Zinc, Lead and Smelting Co. (Former) site, KSD984971986. The Preliminary Assessment was originally completed by KDHE in 1990. The Site Inspection was completed by EPA in 1992, and the Removal Assessment was completed by EPA in 1993. A potentially responsible party removal action was completed in 2000 with EPA oversight (Reference 4). The site assessment and removal action documentation for the former AZLS site is available in the administrative record for that site and will not be duplicated in this report.

A Site Evaluation (SE) was completed by KDHE at the Caney Smelter Complaint site in 2011. During the SE 24 locations were selected for *in-situ* X-ray fluorescence (XRF) analysis of surficial soil and seven of these were submitted for laboratory analysis. Lead was detected in surface soil samples at concentrations exceeding three times background and both residential and non-residential Tier 2 Risk Based Standards for Kansas levels (RSKs). Lead exceeded the residential RSK level of 400 milligrams per kilogram (mg/kg) in samples SS-3 (623 mg/kg) and SS-18 (740 mg/kg). Lead exceeded the non-residential RSK level of 1,000 mg/kg in samples SS-2 (3,000 mg/kg), SS-12 (1,200 mg/kg), SS-20 (1,300 mg/kg), SS-21 (1,100 mg/kg), and SS-23 (2,500 mg/kg).

Cadmium exceeded the three times background value and the residential Tier 2 RSK level of 39 mg/kg in soil sample SS-23 (56 mg/kg). Zinc exceeded the three times background value and the residential Tier 2 RSK level of 23,500 mg/kg in soil sample SS-23 (31,000 mg/kg). Arsenic exceeded the residential Tier 2 RSK level of 11 mg/kg in soil samples SS-2 (19 mg/kg), SS-20 (16 mg/kg), SS-21 (17 mg/kg), and SS-23 (18 mg/kg); however, arsenic did not exceed the three times background value of 23 mg/kg in any sample analyzed.

Chromium exceeded the residential Tier 2 RSK level of 33.6 mg/kg in soil samples SS-18 (68 mg/kg), SS-20 (38 mg/kg), SS-21 (35 mg/kg), and SS-23 (34 mg/kg); however chromium did not exceed the three times background value of 70 mg/kg in any sample analyzed. The SE recommended completion of an IA (Reference 5).

4.0 Physical Setting

4.1 Land Use

The site is located in a residential and agricultural area of Caney, Montgomery County, Kansas. There are two residences on the property and the primary use of the property is residential. The nearest residences are on the site.

4.2 Soils and Geology

The site is located within the Osage Cuestas physiographic area of Kansas. Soils at the site are classified as Bates-Collinsville complex (4 to 20 percent slopes), and Dennis silt loam (1 to 4 percent slopes). The Bates-Collinsville complex is comprised of the Bates series and the Collinsville series. The Bates Series consist of moderately deep, well drained, moderately permeable soils on uplands, formed in material weathered from thinly bedded sandstone and interbedded sandy and silty shale. The Collinsville series consist of shallow, well drained, moderately rapidly permeable upland soils, formed in material weathered from sandstone. The Dennis series consist of deep, moderately well drained, slowly permeable soils on uplands, formed from material weathered from shale (References 5 and 6). The surfical geology at the site consists of shale, siltstone, and fine-grained sandstone of the Pennsylvanian Stranger Formation. Depth to bedrock in the site area is generally shallow (within 10-15 feet).

4.3 Hydrogeology

Groundwater availability is generally limited to alluvial areas of the Little Caney River west of the site. With the shallow depth to bedrock across the site area, groundwater is not expected to be encountered at the site before bedrock refusal. Groundwater flow is expected to follow surface contours in the site area. Very small to moderate yields of groundwater can be obtained from the Pennsylvanian Stanton Limestone Formation and the Chanute Shale Formation but groundwater in the site area is typically very mineralized. Area wells range in depth from 40 feet to 200 feet below ground surface (References 5 and 7).

5.0 Receptors

5.1 Groundwater Pathway

A search of the Kansas Geological Survey water well completion records (Form WWC-5) identified no domestic or public water supply wells constructed within one mile of the site (Reference 7). A total of 15 domestic wells were identified within the four mile target distance limit (Reference 7). There are 2.41 persons per household in Montgomery County, which equates to 37 potential drinking water targets associated with domestic wells within the four mile target distance limit (References 7, 8, and 9). However, this estimate of the groundwater targets is limited by the WWC-5 water well record database, which only contains records of wells drilled since 1975. There are no public water supply wells located within four miles of the site.

5.2 Soil and Air Pathways

The site area is residential and agricultural. Approximately 2,140 persons live within one mile (Reference 9). There are two residences located on the site. Areas of lead, arsenic, cadmium, chromium, and zinc contamination in soil are located within 200 feet of these

two residences. There are 2.41 persons per household in Montgomery County (Reference 9), which equates to 5 Level I soil targets living on the site. The Caney High School is located within ¼ mile west of the site.

5.3 Surface Water Pathway

There are no surface water bodies present at the site. Drainage is generally to the south. The adjacent property to the south appears to receive surface water drainage from the site, and a pond is present within 100 feet of the southern site boundary that may receive drainage from the site. Horses and cattle were observed drinking from the pond during the site field activities. There does not appear to be a well-developed overland flow drainage from the site to any intermittent streams or larger water bodies other than the ponds south of the site. The nearest surface water body is the Little Caney River located approximately two miles west of the site. A probable point of entry was not established for the surface water pathway. Future site assessment activities should include sampling of the off-site pond to the south of the Layton property.

6.0 Assessment Activities

6.1 Description of Field Activities

On December 10, 2014, Randolph L. Brown, P.G., conducted a site reconnaissance and selected 20 locations for *in-situ* XRF analysis with KDHE's Innov-X XRF analyzer consistent with EPA Method 6200 (Reference Method 6200). The typical run time was 30 seconds and three analyses were conducted per location. The mylar window of the XRF was gently wiped with a soft cloth in between analyses to clean the mylar window.

After completion of the initial XRF analysis, several samples were also collected for *ex-situ* analysis and later laboratory analysis. *In-situ* analysis was conducted by clearing the sampling location with a hand-held hoe or mattock, and placing the XRF directly on the ground surface to the exposed soil face. *Ex-situ* samples were collected with a stainless steel trowel directly into a freezer bag marked with the time, date, and location of the sample. Bagged samples were manually homogenized in the bag and visible larger gravel fractions removed from the bags.

Based on the December 10 results, Brown returned on December 17, 2014, and conducted *in-situ* XRF analysis at an additional 19 locations for a total of 39 on-site *in-situ* XRF sample locations. From the *in-situ* analyses, 12 *ex-situ* samples were analyzed with KDHE's Innov-X XRF analyzer. The *ex-situ* XRF analyses were completed on January 29, 2015.

From the *ex-situ* analyses, seven were submitted to Continental Analytical Services of Salina, Kansas, for Resource Conservation and Recovery Act (RCRA) metals analysis by EPA Method 6010. Laboratory samples were collected by subsampling the *ex-situ* soil

bags into four or eight ounce laboratory jars. The four highest *ex-situ* samples were also submitted for Toxicity Characteristic Leachate Procedure (TCLP) by EPA Method 1311.

Review of the SE indicated the background samples were collected in the Caney City Park. In southeastern Kansas many municipalities used smelter waste and slag from abandoned smelter sites within the city as base material and fill for streets, sidewalks, etc. Three background samples were collected on December 17, 2014, from the unpaved 1450 Road south of the site in the prevailing upwind direction.

6.2 Sampling Plan Deviations

The original Field Sampling Plan specified 15 locations, but based on the *in-situ* XRF analyses and possible bias of the original background samples, an additional 23 on-site and three background soil samples were collected.

6.3 Quality Assurance and Quality Control

Quality assurance for this projected consisted of the laboratory contract lab quality assurance/quality control parameters for each analysis. No significant quality control parameters were exceeded in the laboratory data and none of the laboratory data was rejected. Quality control parameters for XRF analyses are discussed in Section 7 below.

A rinsate sample was collected during decontamination of the stainless steel trowels used for *ex-situ* XRF analysis. No detections of the primary metals of concern were noted in the rinsate sample indicating no apparent cross contamination or compromising of sample quality. The Ludlum radiation survey meters were both calibrated in December 2014 and thus within the one-year acceptable calibration time. The check source for the GM pancake detector and NaI scintillator was within the recommended instrument response tolerance (see Table 11).

7.0 Assessment Results

The maximum *ex-situ* and laboratory lead results were 6,366 mg/kg and 5,570 mg/kg, respectively at location L-19. The maximum *in-situ* lead detection was 3,824 mg/kg at location L-18. Lead was detected above its residential RSK in 10 of the 38 on-site samples by either XRF or laboratory analysis.

Lead was detected at a maximum of 9.59 milligrams per liter (mg/L) by TCLP in sample L-33, above its 5 mg/L RCRA threshold concentration. Sample L-33 was the only sample out of four analyzed to exceed its lead TCLP RCRA threshold.

Arsenic, cadmium, and zinc were also detected above residential RSKs in one or more samples. Arsenic was detected at a maximum of 59.5 mg/kg in L-19, above its residential RSK of 18.9 mg/kg and above its site-specific three times background concentration of 30.6 mg/kg. Cadmium was detected at a maximum of 72.2 mg/kg in L-

19, above its residential RSK of 39 mg/kg and above its three times background concentration of 6 mg/kg. Chromium was detected at a maximum of 34 mg/kg in L-19, slightly above its residential RSK of 33.6 mg/kg and above its three times background concentration of 30.4 mg/kg. Zinc was detected at a maximum of 29,800 mg/kg in L-19, above its residential RSK of 23,500 mg/kg and its three times background concentration of 519.1 mg/kg. All of the other RCRA metals exceeding residential RSKs occurred in samples with associated lead detections above 400 mg/kg. The complete data tables are included in Appendix 11.1.

A linear regression was calculated for lead samples analyzed by *in-situ* XRF analysis vs. laboratory analysis, *ex-situ* XRF analysis vs. laboratory analysis, and *in-situ* XRF analysis vs. *ex-situ* XRF analysis. The highest coefficients of correlation and determination were observed in the *ex-situ* XRF analysis vs. laboratory analysis. This regression yielded a coefficient of correlation of of r = 0.9843 and a coefficient of determination (the square of the coefficient of correlation) of r^2 = 0.9689. The *in-situ* XRF analysis vs. laboratory analysis yielded r = 0.9233 and r^2 = 0.8524. The regression of *in-situ* XRF analysis vs. *ex-situ* XRF analysis yielded r = 0.9233 and r^2 = 0.8525 for lead.

According to EPA Method 6200, an r^2 value of 0.9 or higher can be considered *quantitative definitive level data*. An r^2 value of 0.7 to 0.9 can be considered *quantitative screening level data*. The coefficients of correlation and determination for lead calculated for this site indicates that the XRF data obtained from the *ex-situ* XRF analysis of surficial soil samples can be considered quantitative definitive level data and the *in-situ* XRF analyses could be considered quantitative screening level data (Reference 10).

The maximum relative standard deviation (RSD) was calculated to be 2.7 % for all XRF analyses, well within the EPA Method 6200 acceptable RSD value of 20 %. The percent difference (PD) between the National Institute of Standards and Testing certified lead standards used during the IA and the XRF analyzed value indicated a maximum PD of 12.3 %, well within the acceptable PD value established by Method 6200 of 20 % (Reference 10). The regressions are included as Tables 7-9.

8.0 Removal Considerations

Lead, arsenic, cadmium, chromium and zinc have been detected above residential RSKs. The highest level of lead detected during the IA was in L-19 at 6,366 mg/kg by *ex-situ* XRF analysis and 5,570 mg/kg by laboratory analysis, which is also the highest historical lead detection at the site. Arsenic, cadmium, chromium, and zinc have been detected above residential RSKs in both the SE and IA. The maximum detections of arsenic, cadmium, chromium and zinc during the IA correlated with locations of elevated lead concentrations.

The site appears to qualify for consideration of a removal action consistent with the following criteria of §300.400(b)(2) of the NCP: *(i) Actual or potential exposure to*

nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants; (iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate; (vii) the availability of other appropriate federal or state response mechanisms to respond to the release; and *(viii) Other situations or factors that may pose threats to public health or welfare of the United States or the environment* (Reference 11). The proximity of the site to residential areas of Caney and two residences at the site may be cited as potential justification for §300.400(b)(2)(viii).

Sampling at the site has consisted of biased or semi-stratified sampling strategies utilizing discrete sampling locations. Further removal site assessment and removal actions should also utilize appropriate decision-making and sampling strategies in the *Superfund Lead-Contaminated Residential Sites Handbook.* The TCLP data collected for the IA also indicates that if some of the contaminated soil and waste from the site are excavated, these may potentially be RCRA characteristic hazardous waste and will need additional waste characterization if being disposed off-site. Although not likely to be present, mercury has not been analyzed in soil samples and should be verified to not be of concern in subsequent sampling efforts during future removal site evaluation.

9.0 Conclusions

Lead, arsenic, cadmium, chromium, and zinc are present at this site above RSKs. The site property includes two residences and is adjacent to other residential areas of Caney. The site appears to qualify for additional removal site evaluation and consideration of a removal action consistent with the NCP. It is recommended that any future comprehensive site sampling also include properties containing the American Vitrified Brick Company since high levels of lead and other metals are present along the former rail spur on the northern edge of the Caney Smelter Complaint site, and the properties containing the former American Vitrified Brick Company have not been previously assessed.

During the site activities some waste was also observed on the property adjacent to the south of the Layton property, and this property also receives surface water drainage to the pond located within 100 feet of the southern property boundary of the Layton property. Future sampling should include soil and surface water on the property to the south of the Layton property. A post-removal Site Inspection may be warranted to collect additional samples to evaluate pathways not addressed through a future removal action.

The elevated levels of zinc in L-18 and L-19 may be a diagnostic indicator that the contamination in this area is primarily from former smelter activities at the AZLS site. The levels of zinc are higher than that expected from glass production and are consistent with primary lead and zinc smelting. These samples were also taken near the abandoned rail spur which ran to the AZLS site.

10.0 References

1) Interview with Mr. Larry Layton of Caney, Kansas, December 10, 2014.

2) Sanborn Fire Insurance Maps, Caney, Kansas 1894-1927.

3) *A Standard History of Kansas and Kansans*, (entry for Joseph Bernauer), 1918.

4) CERCLA Information System, accessed March 4, 2015.

5) *Site Evaluation, Caney Smelter Complaint Site,* KDHE, 2011.

6) United States Department of Agriculture, *Soil Survey of Wilson County*, 2015.

7) Kansas Geological Survey, geology and water well database, available at: http://www.kgs.ku.edu/, accessed March 4, 2015.

8) United States Environmental Protection Agency, November 1992, *The Hazard Ranking System Guidance Manual*, Publication 9345.1-07.

9) U.S. Census Bureau State and County Quick Facts available at: http://quickfacts.census.gov/qfd/, accessed March 4, 2015.

10) U.S. EPA, Solid Waste SW-846 Methods: Method 6200, *Field Portable X-ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment*, first edition January 1998 and U.S. Environmental Protection Agency (EPA), Solid Waste SW-846 Methods: Method 6200, *Field Portable X-ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment,* revised February 2007.

11) *National Oil and Hazardous Substances Pollution Contingency Plan,* 40 CFR §300.

12) Kansas Department of Health and Environment, *Risk-based Standards for Kansas (RSK) Manual,* 2014.

13) U.S. Environmental Protection Agency, *Guidance for Performing Preliminary Assessments under CERCLA,* EPA 540/G-91/013, 1991.

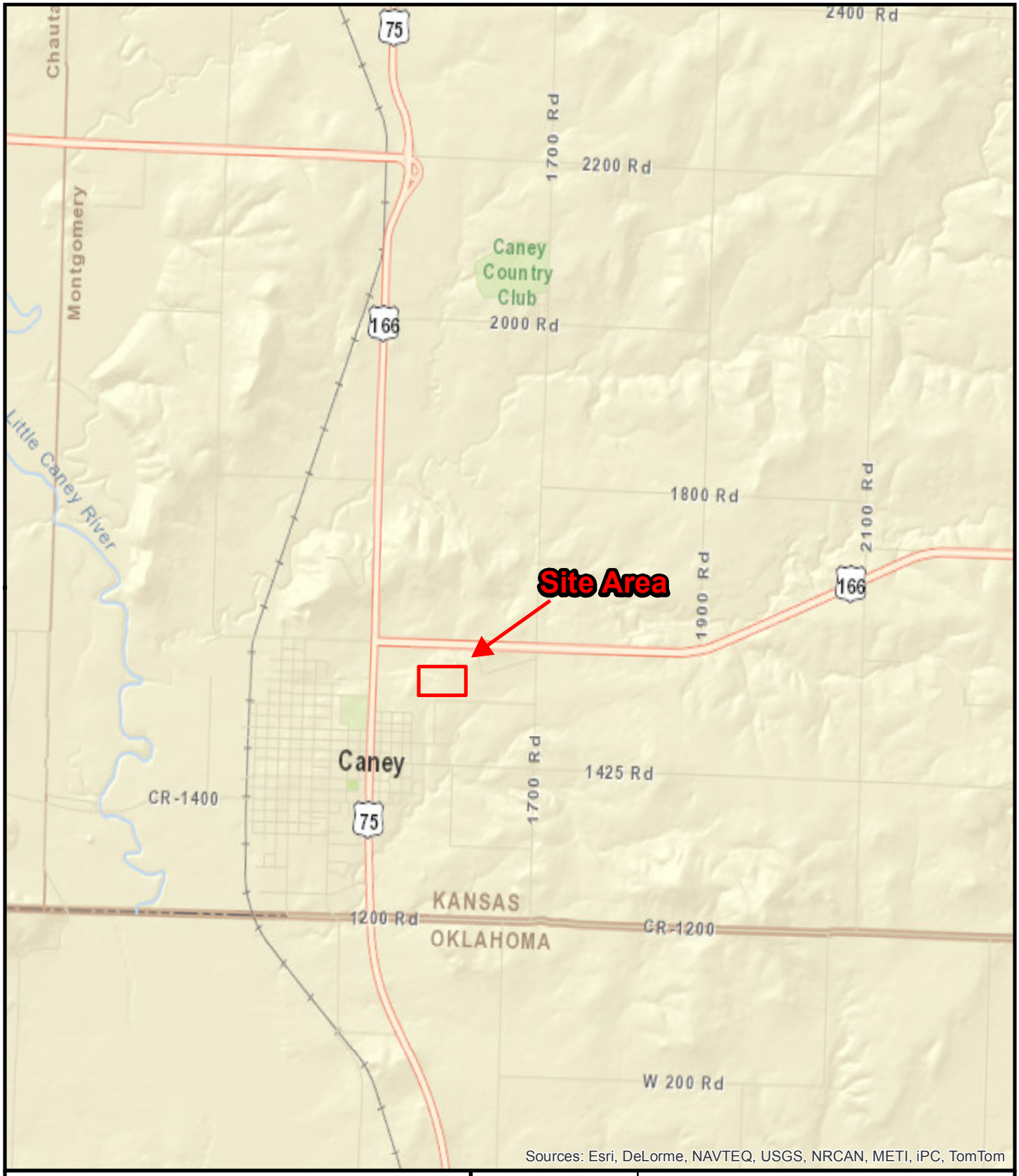
14) U.S. Environmental Protection Agency, *Guidance for Performing Site Inspections under CERCLA,* OSWER Directive 9345.1-05, 1992.

15) U.S. Environmental Protection Agency, *Hazard Evaluation Manual: A Guide to Removal Actions*, EPA Region III, 1993.

16) U.S. Environmental Protection Agency, *Superfund Lead-Contaminated Residential Sites Handbook, Final,* August 2003.

11.0 Appendices

11.1 Figures and Tables



Montgomery County

N

0 0.5 1 2 Miles

Kansas Department of Health and Environment

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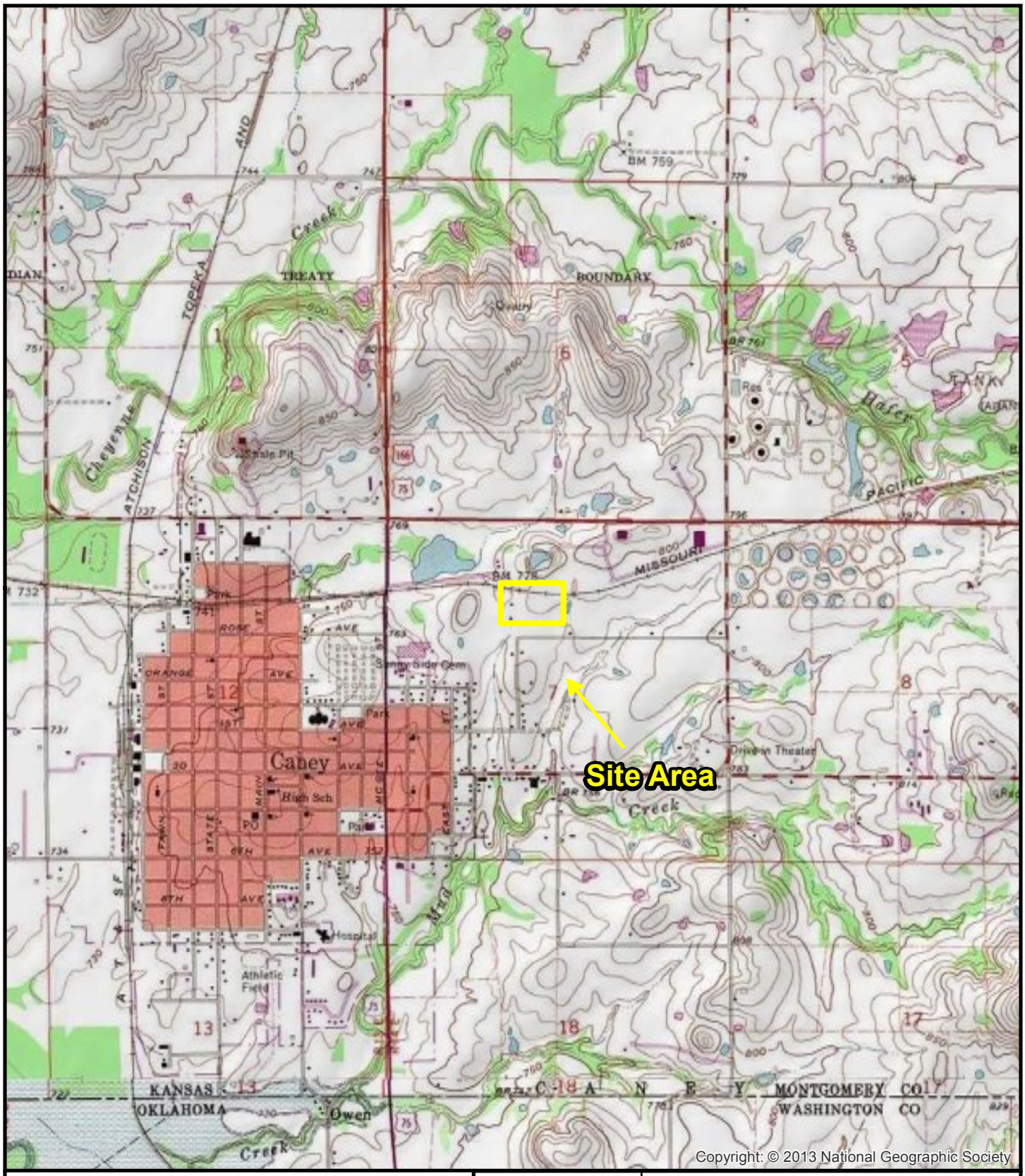
TITLE:	**Area Map**			
PROJECT PHASE:	Integrated Assessment			
DRAWN BY:	NS	3/4/15	BASEMAP DATE:	2013
CHECKED BY:	RB	3/4/15	**Figure 1**	



N

0 0.25 0.5 1 Miles

Kansas Department of Health and Environment

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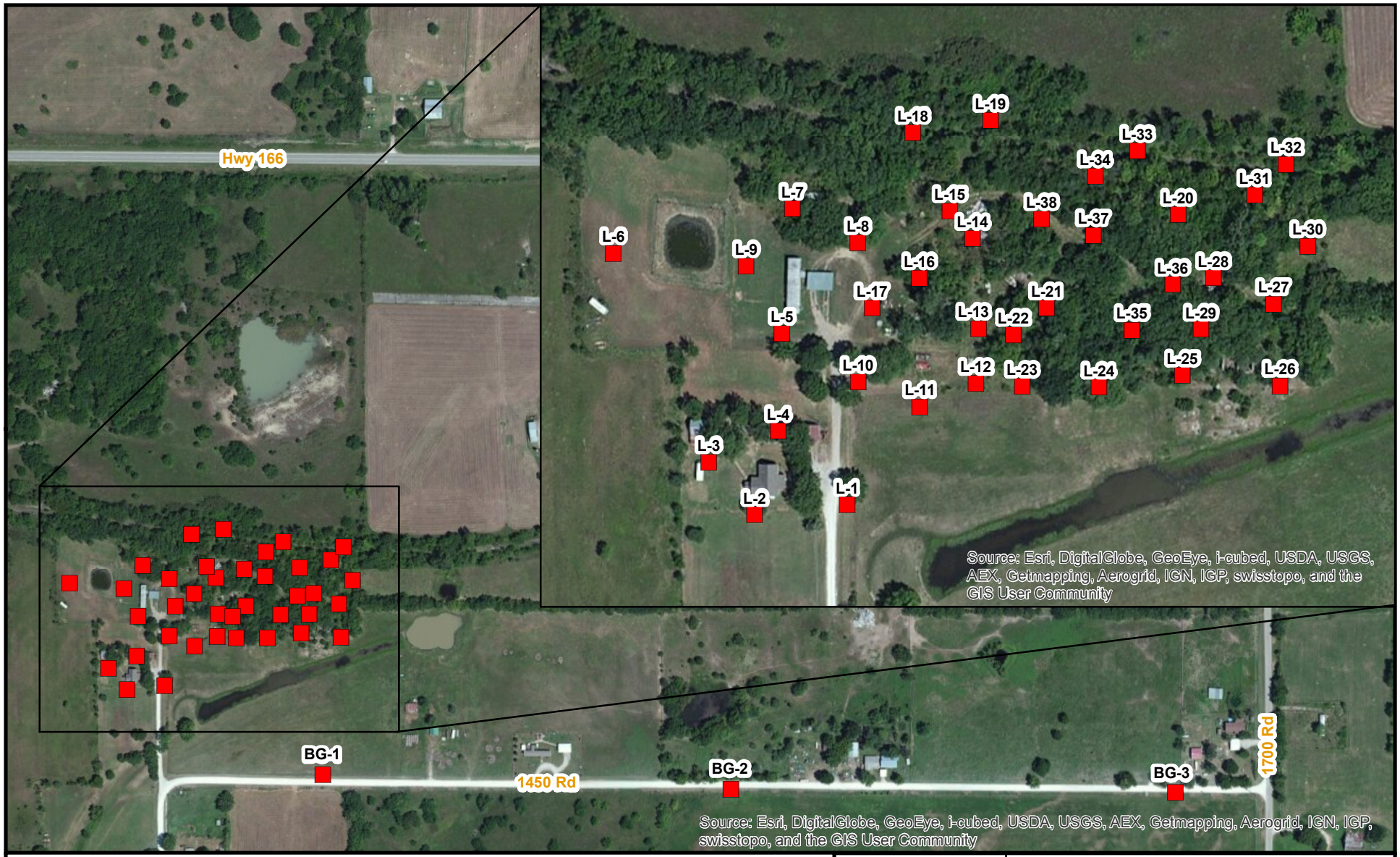
TITLE:	**Topographic Map**		
PROJECT PHASE:	Integrated Assessment		
DRAWN BY:	NS	3/4/15	BASEMAP DATE: 2013
CHECKED BY:	RB	3/4/15	**Figure 2**



LEGEND

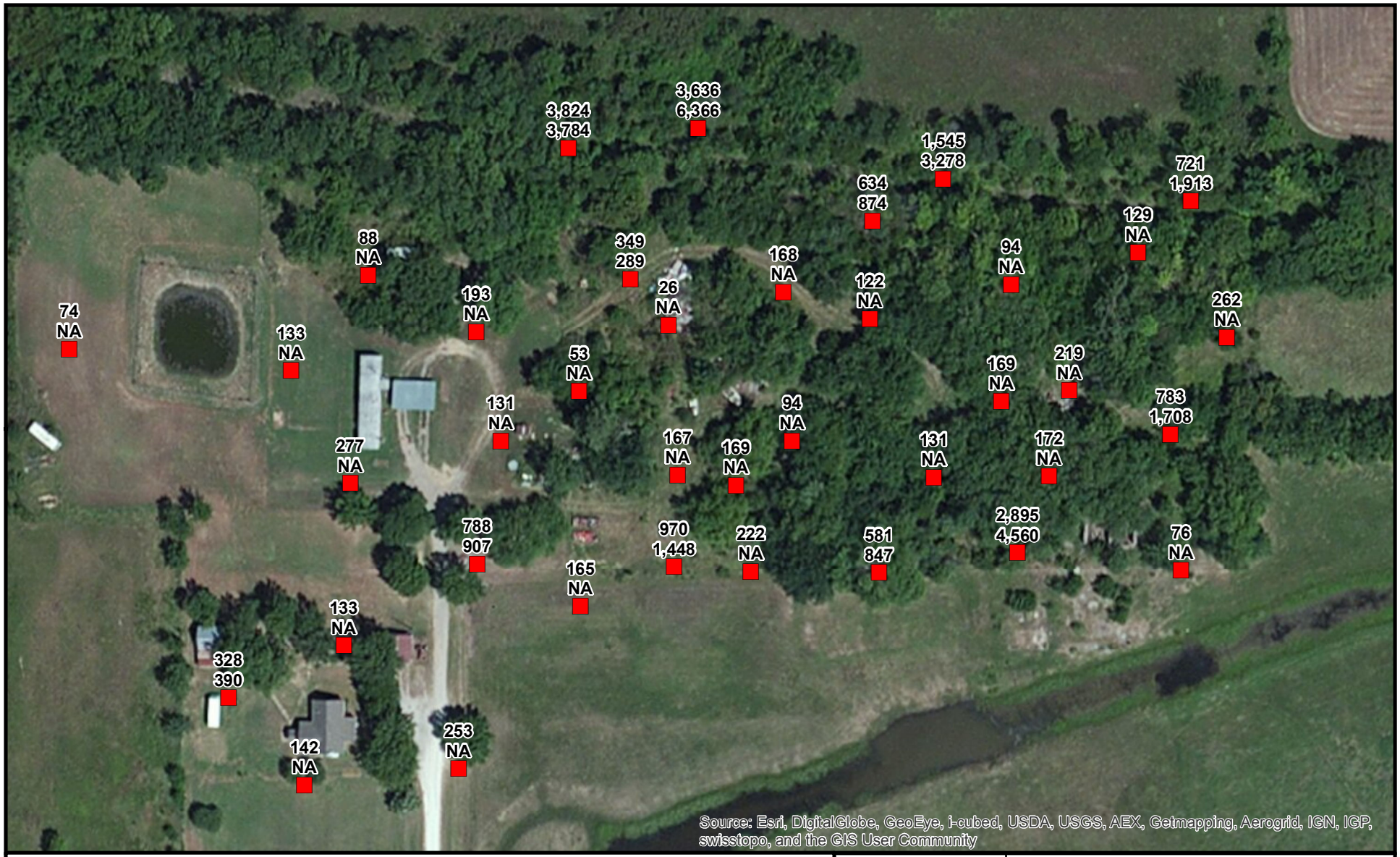
IA Surface Soil Sample

0 200 400 800 Feet

N

Kansas Department of Health and Environment

SITE:	**Caney Smelter Complaint Caney, Kansas**			
TITLE:	**Surface Soil Sample Locations**			
PROJECT PHASE:	Integrated Assessment			
DRAWN BY:	NS	3/2/15	BASEMAP DATE:	2013
CHECKED BY:	RB	3/2/15	**Figure 3**	



LEGEND

IA Surface Soil Sample

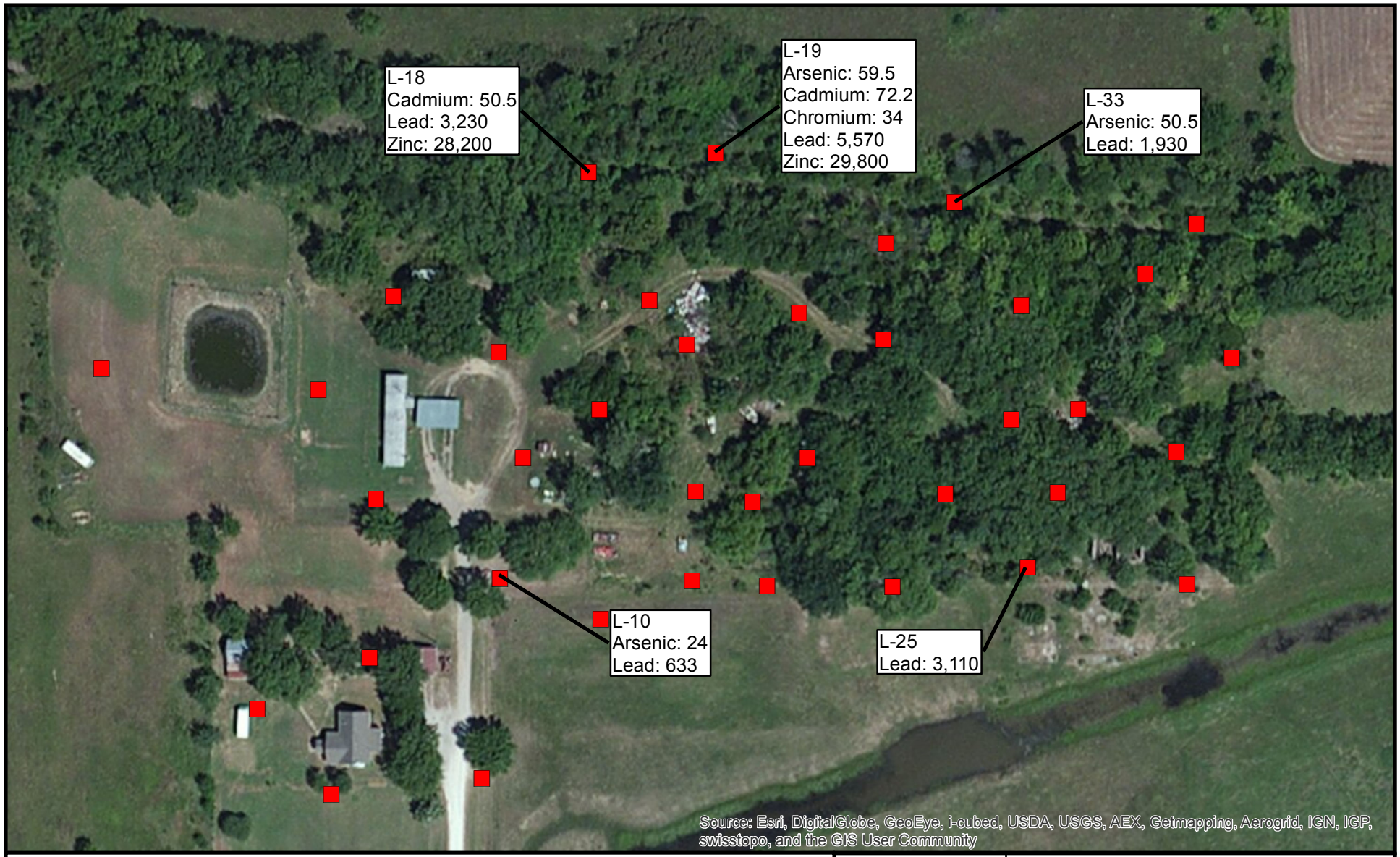
0 50 100 200 Feet

Top value: In-situ XRF result
Bottom value: Ex-situ XRF result
NA- Not analyzed
All results in mg/kg

N

Kansas Department of Health and Environment

SITE:	**Caney Smelter Complaint Caney, Kansas**
TITLE:	**XRF Results for Lead in Surface Soil Samples**
PROJECT PHASE:	Integrated Assessment
DRAWN BY: NS	3/2/15
BASEMAP DATE:	2013
CHECKED BY: RB	3/2/15
	Figure 4



LEGEND

IA Surface Soil Sample

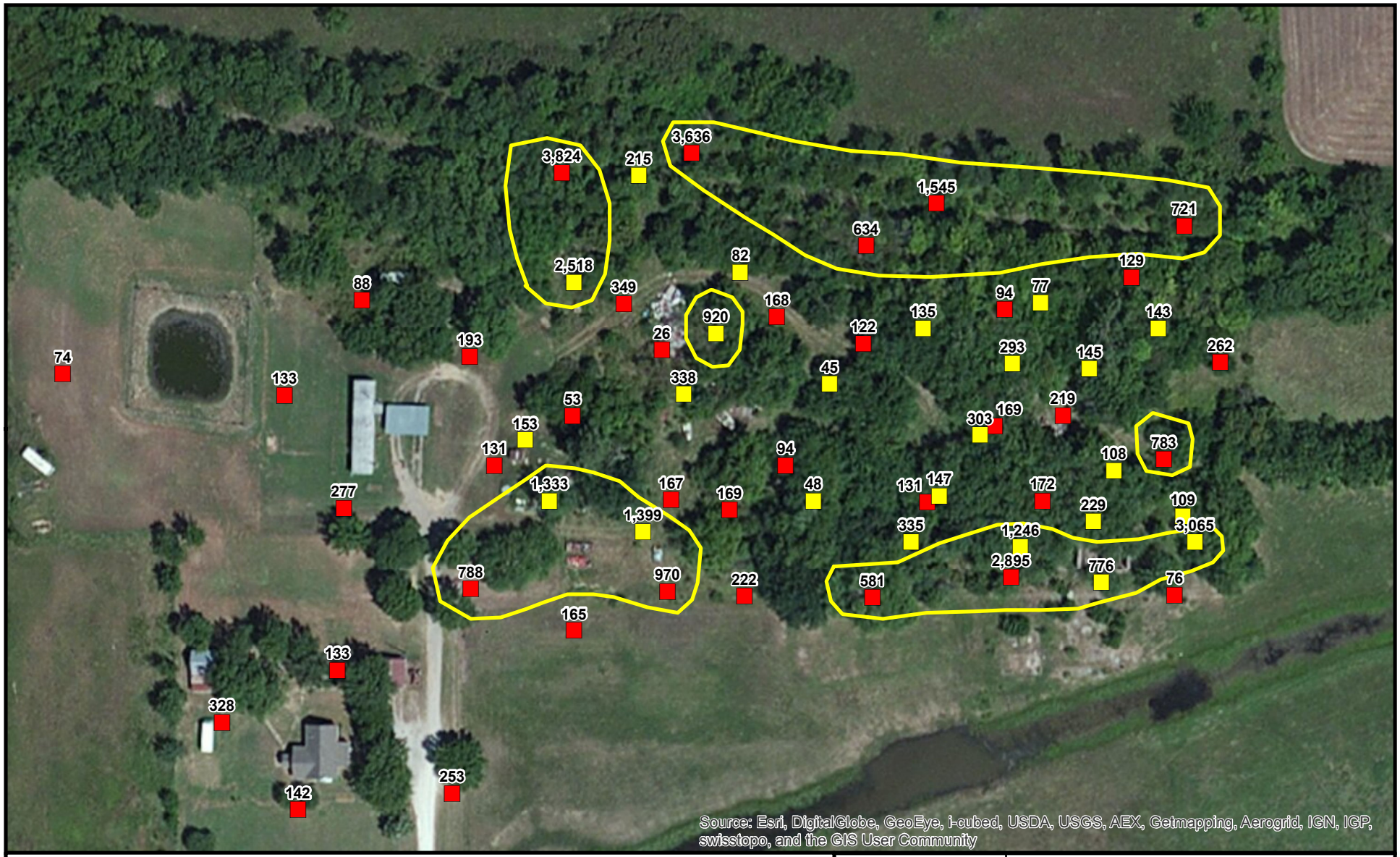
All results in mg/kg

0 50 100 200 Feet

N

Kansas Department of Health and Environment

SITE:	**Caney Smelter Complaint Caney, Kansas**		
TITLE:	**Laboratory Metals Results Above RSK Levels**		
PROJECT PHASE:	Integrated Assessment		
DRAWN BY:	NS	3/2/15	BASEMAP DATE: 2013
CHECKED BY:	RB	3/2/15	**Figure 5**



LEGEND

- SE Surface Soil Sample
- IA Surface Soil Sample
- 400 mg/kg Icoconcentration Line

All results in mg/kg

N

0 50 100 200 Feet

Kansas Department of Health and Environment

SITE:	**Caney Smelter Complaint Caney, Kansas**		
TITLE:	**Cumulative XRF Results for Lead in Surface Soil Samples**		
PROJECT PHASE:	Integrated Assessment		
DRAWN BY:	NS	3/2/15	BASEMAP DATE: 2013
CHECKED BY:	RB	3/2/15	**Figure 6**

Table 1: Total Lead Results by XRF and Laboratory:

Sample I.D.:	*In-Situ* Lead by XRF (mg/kg):	*Ex-Situ* Lead by XRF (mg/Kg):	Lead by Laboratory Analysis (mg/Kg):
L-1	253	NA	NA
L-2	142	NA	NA
L-3	328	390	309
L-4	133	NA	NA
L-5	277	NA	NA
L-6	74	NA	NA
L-7	88	NA	NA
L-8	193	NA	NA
L-9	133	NA	NA
L-10	**788**	**907**	**633**
L-11	165	NA	NA
L-12	**970**	**1448**	NA
L-13	167	NA	NA
L-14	26	NA	NA
L-15	349	289	220
L-16	53	NA	NA
L-17	131	NA	NA
L-18	**3824**	**3784**	**3230**
L-19	**3636**	**6366**	**5570**
L-20	94	NA	NA
L-21	94	NA	NA
L-22	169	NA	NA
L-23	222	NA	NA
L-24	**581**	**847**	NA
L-25	**2895**	**4560**	**3110**
L-26	76	NA	NA
L-27	**783**	**1708**	NA
L-28	219	NA	NA
L-29	172	NA	NA
L-30	262	NA	NA
L-31	129	NA	NA
L-32	**721**	**1913**	NA
L-33	**1545**	**3278**	**1930**
L-34	**634**	**874**	NA
L-35	131	NA	NA
L-36	169	NA	NA
L-37	122	NA	NA
L-38	168	NA	NA
BG-1	NA	91	41
BG-2	NA	39	84.7
BG-3	NA	24	17.4
Tier 2 Residential RSK:		400	400

Abbreviations: mg/Kg – milligrams per kilogram;
XRF- Maximum of three separate analyses by KDHE Innov-X X-ray fluorescence unit using EPA Method 6200;
Laboratory – analysis by Continental Analytical Services using EPA Method 6010;
RSK – Residential Risk-based Standards for Kansas (2014 edition);
Bold concentrations exceed the Tier 2 Risk-based Standards for Kansas;
NA – not analyzed

Table 2: Summary of Laboratory Lead Toxicity Characteristic Leachate Procedure (TCLP) Results

Sample I.D.:	Lead TCLP (mg/L):
L-18	3.50
L-19	2.26
L-25	1.54
L-33	**9.59**
TCLP Limit (mg/L):	5

Abbreviations: mg/L – milligrams per liter.
NA – not analyzed; ND – not detected;
Laboratory analysis by Continental Analytical Services using EPA Method 6010B for TCLP analysis.

Table 3: XRF Quality Control Results

Sample I.D.	Date:	Lead XRF (mg/Kg):	Certified NIST Lead Value (mg/Kg):	Percent Difference:
NIST 2781	12/10/2014	210	202.1	3.9%
NIST 2781	12/10/2014	207	202.1	2.4%
NIST 2711	12/10/2014	1,167	1162	0.4%
Blank	12/10/2014	<8	----------	----------
NIST 2781	12/17/2014	190	202.1	6.0%
NIST 2781	12/17/2014	212	202.1	4.9%
Blank	12/17/2014	<9	----------	----------
NIST 2711	12/17/2014	1123	1162	3.4%
NIST 2781	12/17/2014	227	202.1	12.3%
NIST 2781	01/29/2015	197	202.1	2.5%
Blank	01/29/2015	<10	----------	----------
NIST 2711	01/29/2015	1161	1162	0.1%
NIST 2781	01/29/2015	186		
NIST 2711	01/29/2015	1148		
Sample I.D.	Date:	Lead XRF (mg/Kg):	Standard Deviation:	Relative Standard Deviation:
RSD		3765	46.1	1.2%
RSD		3803		
RSD		3689		
RSD		3801		
RSD		3809		
RSD		3763		
RSD	12/10/2014	3717		
Mean		3764		

Abbreviations: XRF- KDHE Innov-X X-ray fluorescence unit using EPA Method 6200; NIST – National Institute of Standards and Technology reference materials and certified concentrations.
Method 6200 used for methodology in calculating percent difference and relative standard deviation.

Table 3: XRF Quality Control Results (Continued)

Sample I.D.	Date:	Lead XRF (mg/Kg):	Standard Deviation:	Relative Standard Deviation:
RSD		794	15.7	2.0%
RSD		778		
RSD		822		
RSD		812		
RSD		805		
RSD		812		
RSD	12/17/2014	787		
Mean		801		
Sample I.D.	Date:	Lead XRF (mg/Kg):	Standard Deviation:	Relative Standard Deviation:
RSD		378	10.2	2.7%
RSD		390		
RSD		389		
RSD		387		
RSD		368		
RSD		375		
RSD	01/29/2015	365		
Mean		379		

Abbreviations: XRF- KDHE Innov-X X-ray fluorescence unit using EPA Method 6200; NIST – National Institute of Standards and Technology reference materials and certified concentrations.
Method 6200 used for methodology in calculating percent difference and relative standard deviation.

Table 4: Laboratory Metals Results for Soils in milligrams per kilogram (mg/kg)

Sample I.D.:	Arsenic:	Barium:	Cadmium:	Chromium:	Lead:	Zinc:	Selenium:	Silver:
BG-1	5	142	2	11.4	41	218	ND (3)	1.1
BG-2	6.6	67.6	ND (1)	8.9	84.7	208	ND (3)	1.1
BG-3	**19**	74.8	2	10.1	17.4	93.1	ND (0.5)	0.8
L-3	30	128	*25*	12.8	*309*	*2300*	ND (0.5)	*2.1*
L-10	**24**	101	*10*	14.5	***633***	*4220*	ND (0.5)	*4.1*
L-15	10	95.1	*39*	18.6	*220*	7800	ND (0.5)	*3.7*
L-18	***42***	252	***50.5***	17	***3230***	***28200***	ND (3)	*5*
L-19	***59.5***	*346*	***72.2***	***34***	***5570***	***29800***	*3*	*9*
L-25	14	90.5	*35*	13.9	***3110***	*23200*	*1.3*	*3.5*
L-33	***50.5***	151	*22*	10.1	***1930***	*10900*	ND (0.5)	3.9
Three times background	30.6	284.4	6	30.4	143.1	519.1	ND	3
Residential RSK	18.9	15,300	39	33.6	400	23,500	391	391

Abbreviations: RSK – Tier 2 Residential Risk-based Standards for Kansas (2014 edition);
Bold concentrations exceed the Tier 2 Risk-based Standards for Kansas;
Italic indicates above three times background. All samples analyzed by Continental Analytical Services using EPA Method 6010.
ND – not detected at the indicated detection limit.

Table 5: Rinsate Sample Results in milligrams per liter (mg/L)

Sample I.D.:	Arsenic:	Barium:	Cadmium:	Chromium:	Lead:	Zinc:	Selenium:	Silver:
Rinsate	ND (0.005)	ND (0.005)	ND (0.002)	ND (0.005)	ND (0.003)	ND (0.010)	ND (0.005)	ND (0.005)

Analysis by Continental Analytical Services using EPA Method 6010.
ND – not detected at the indicated detection limit.

Table 6: Global Positioning Satellite Coordinates

Sample I.D.:	Latitude:	Longitude:
BG-1	37.01887	-95.91983
BG-2	37.01881	-95.91573
BG-3	37.01877	-95.91123
L-1	37.01960	-95.92143
L-2	37.01957	-95.92181
L-3	37.01973	-95.92200
L-4	37.01984	-95.92171
L-5	37.02014	-95.92170
L-6	37.02042	-95.92239
L-7	37.02057	-95.92165
L-8	37.02048	-95.92123
L-9	37.02038	-95.92184
L-10	37.02000	-95.92139
L-11	37.01992	-95.92113
L-12	37.01999	-95.92090
L-13	37.02017	-95.92089
L-14	37.02047	-95.92091
L-15	37.02056	-95.92101
L-16	37.02034	-95.92113
L-17	37.02024	-95.92132
L-18	37.02082	-95.92116
L-19	37.02085	-95.92084
L-20	37.02052	-95.91990
L-21	37.02024	-95.92060
L-22	37.02015	-95.92075
L-23	37.01999	-95.92071
L-24	37.01999	-95.92040
L-25	37.02002	-95.92005
L-26	37.01999	-95.91965
L-27	37.02025	-95.91968
L-28	37.02026	-95.91995
L-29	37.02017	-95.91997
L-30	37.02045	-95.91954
L-31	37.02061	-95.91975
L-32	37.02072	-95.91976
L-33	37.02076	-95.92024
L-34	37.02067	-95.92041
L-35	37.02017	-95.92026
L-36	37.02032	-95.92009
L-37	37.02059	-95.92040
L-38	37.02053	-95.92063
Measured with Garmin III unit, typical accuracy ± 20 feet		

Table 7: Linear Regression of Lead Concentrations by *In-Situ* XRF Analysis vs. Ex-Situ XRF Analysis

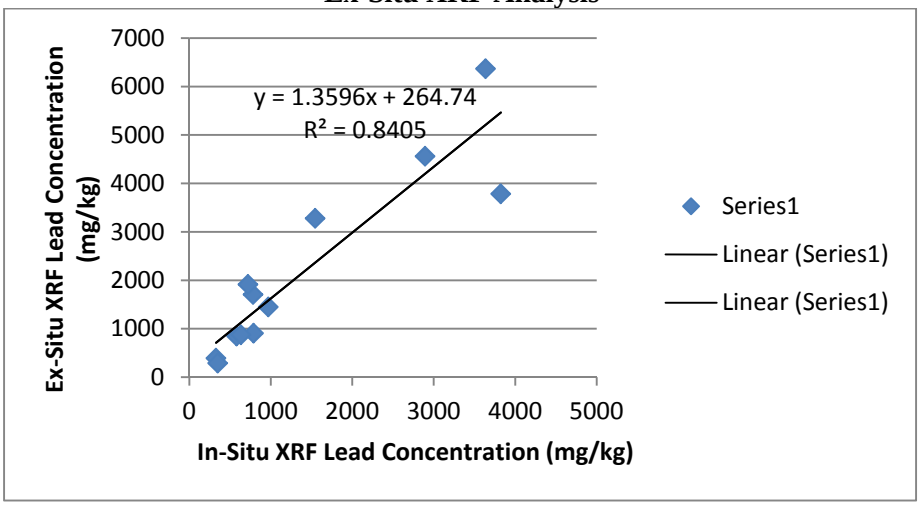


Table 8: Linear Regression of Lead Concentrations by *Ex-Situ* XRF analysis vs. Laboratory Analysis

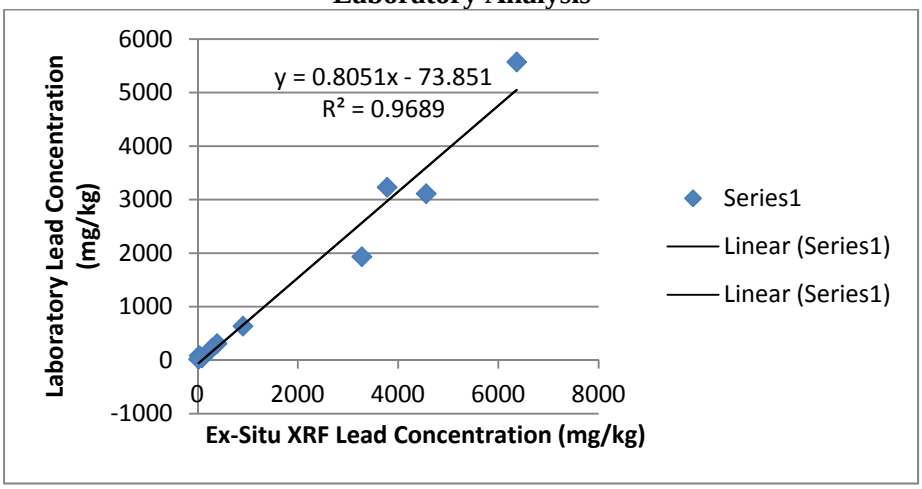
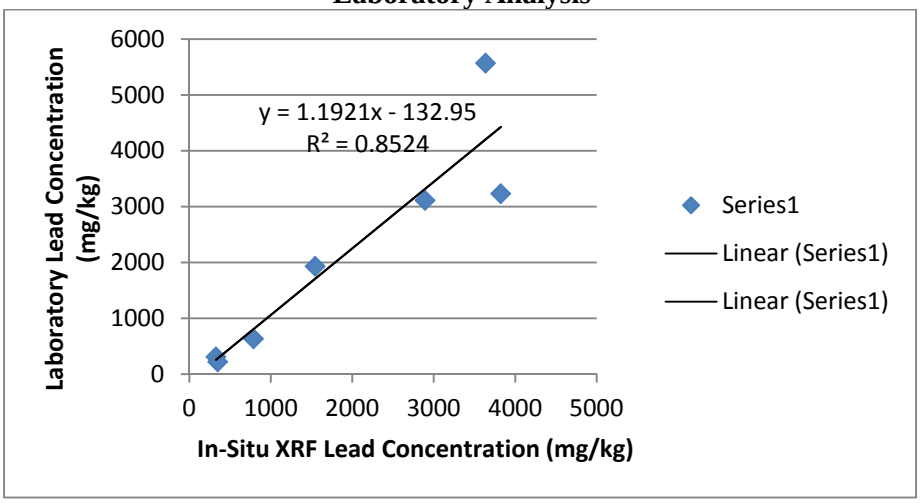


Table 9: Linear Regression of Lead Concentrations by *In-Situ* XRF analysis vs. Laboratory Analysis



11.2 Photographic Documentation

Caney Smelter Complaint
Integrated Assessment

Photo 1
View: North
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-1 soil sample location.

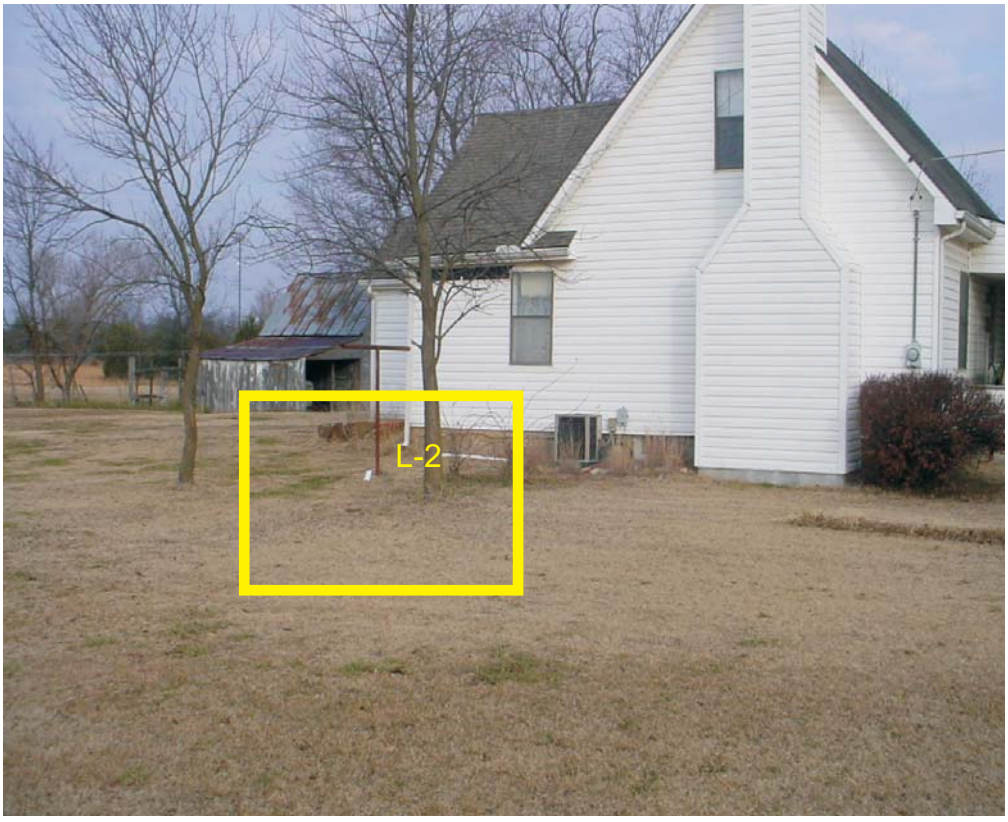


Photo 2
View: Northwest
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-2 soil sample location near Layton residence.

Caney Smelter Complaint
Integrated Assessment

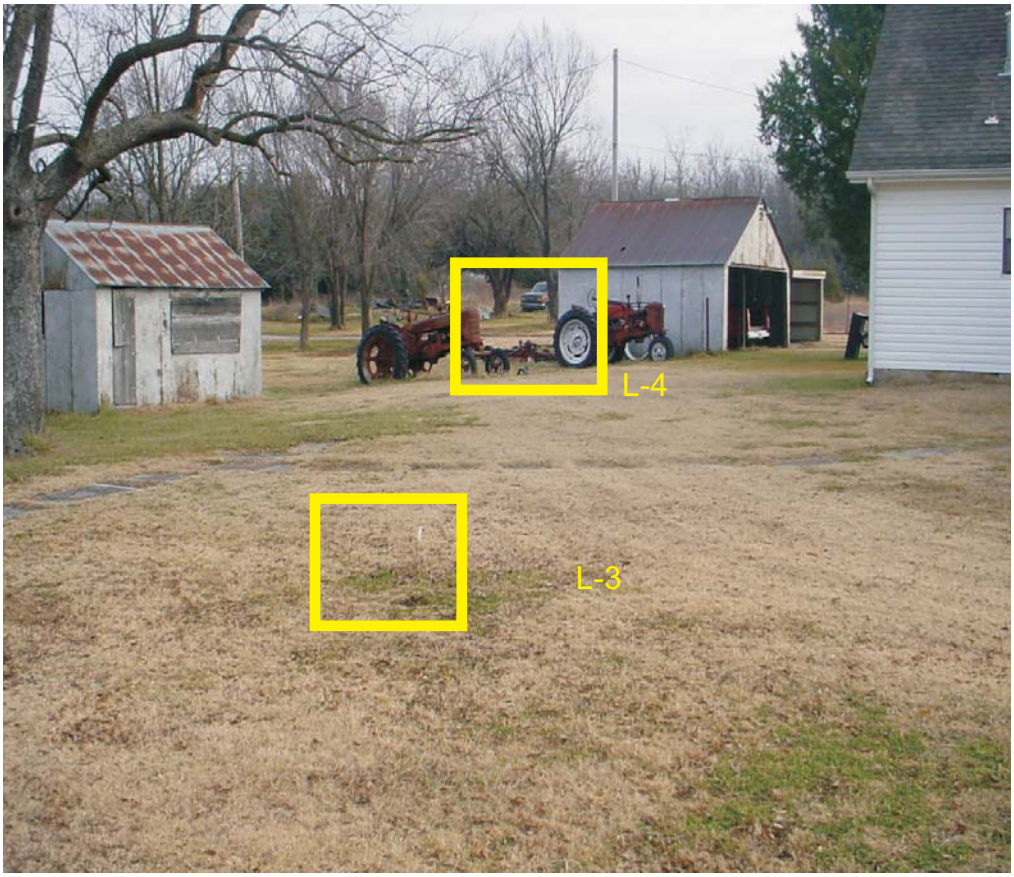


Photo 3
View: East
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-3 and L-4 soil sample locations near Layton residence.

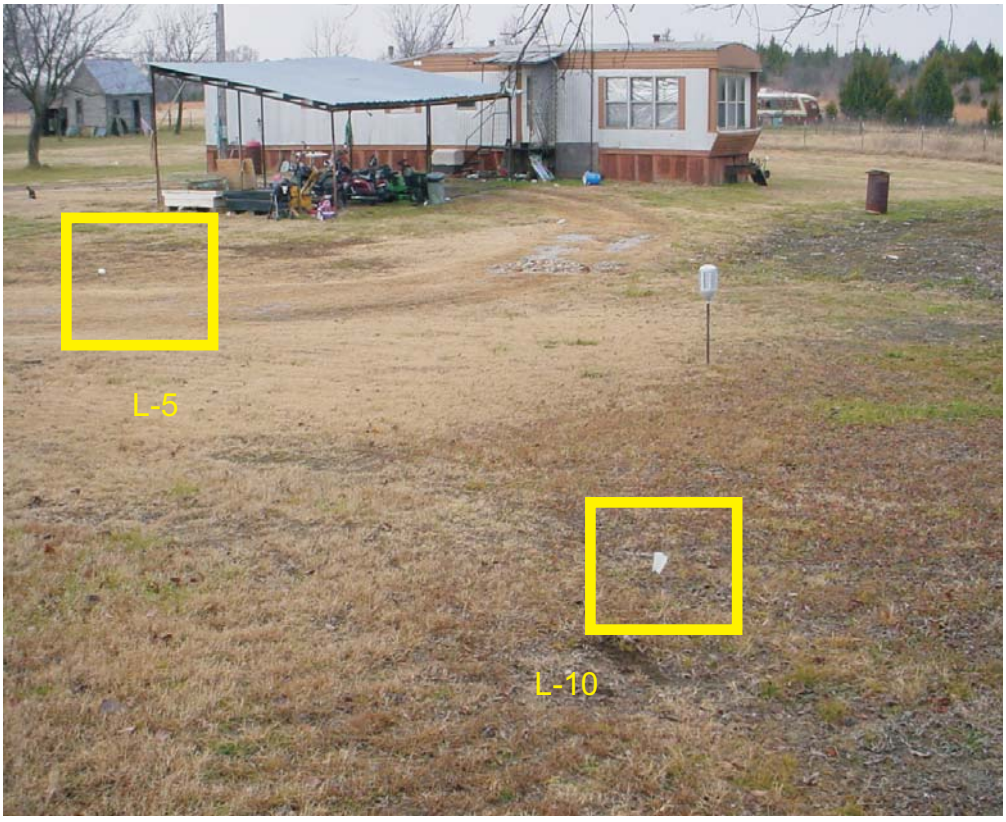


Photo 4
View: Northwest
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-5 and L-10 soil sample locations near Layton rental residence.

Caney Smelter Complaint
Integrated Assessment

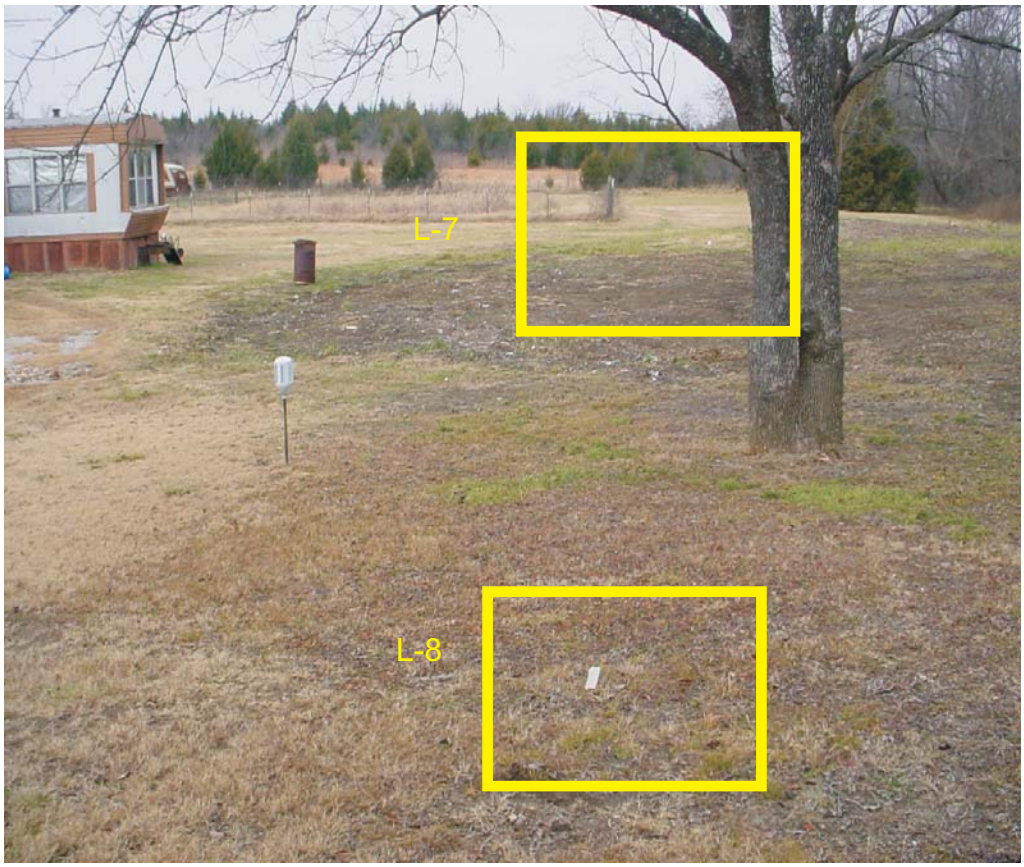


Photo 5
View: West
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-7 and L-8 soil sample locations near Layton rental residence.

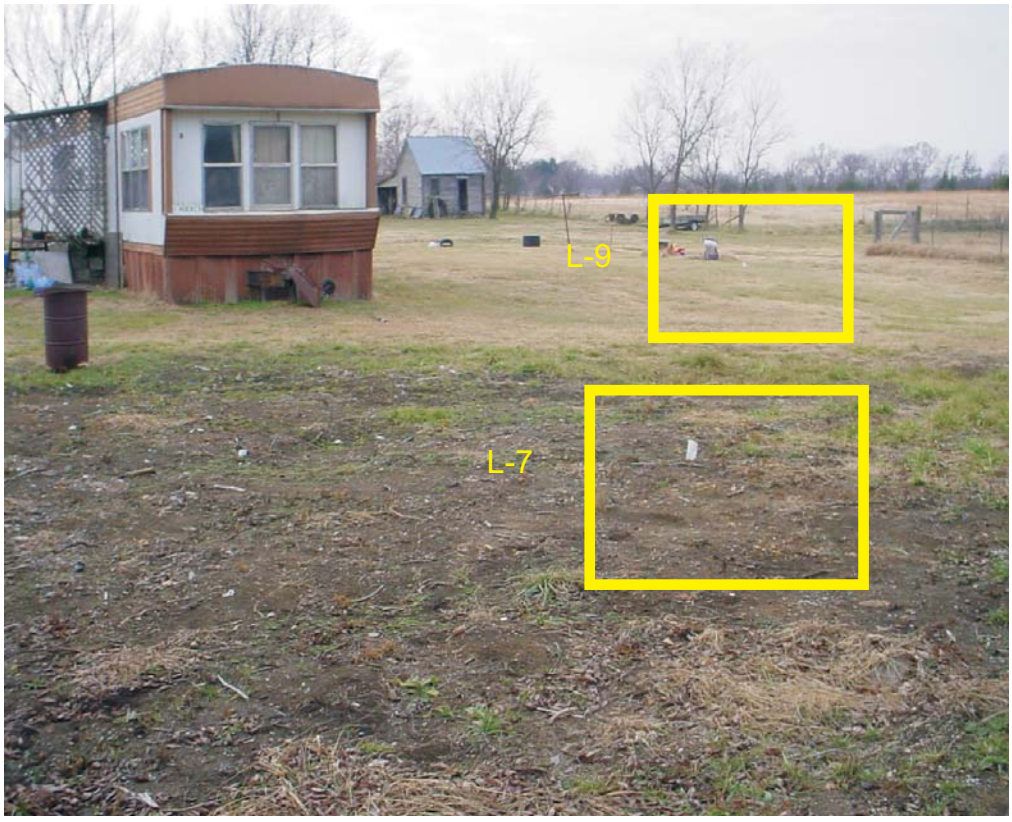


Photo 6
View: Southwest
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-7 and L-9 soil sample locations near Layton rental residence.

Caney Smelter Complaint
Integrated Assessment

Photo 7
View: West
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-6 soil sample location near Layton rental residence.

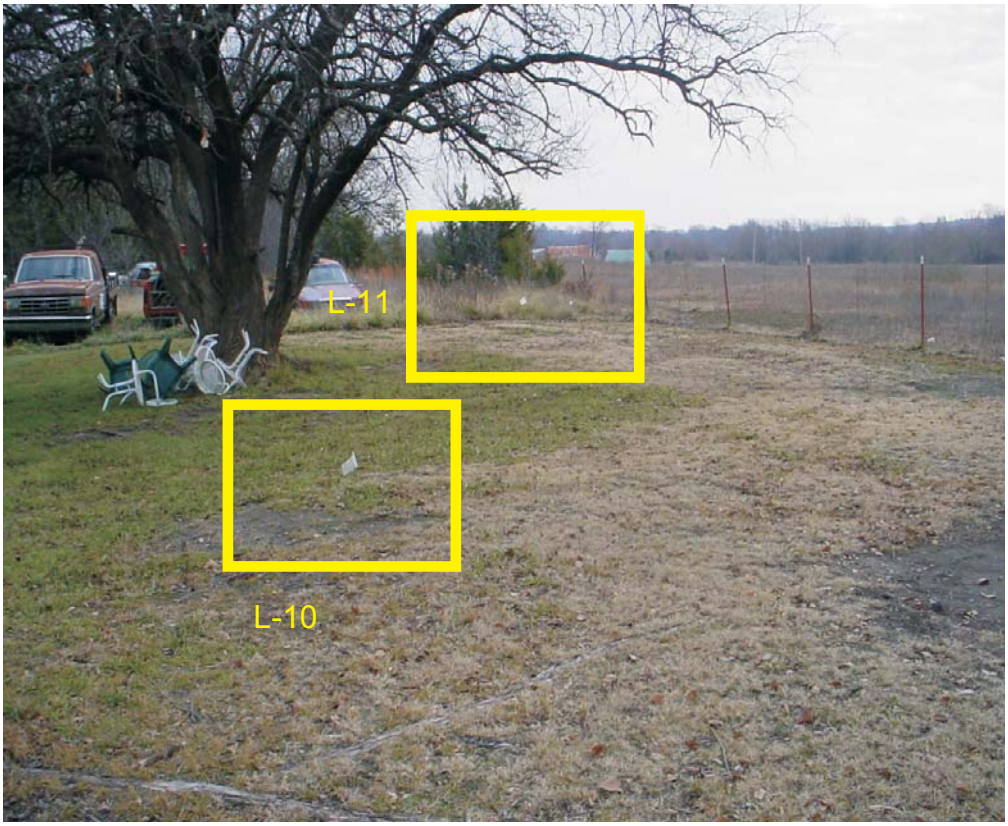


Photo 8
View: Southeast
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-10 and L-11 soil sample locations.

Caney Smelter Complaint
Integrated Assessment

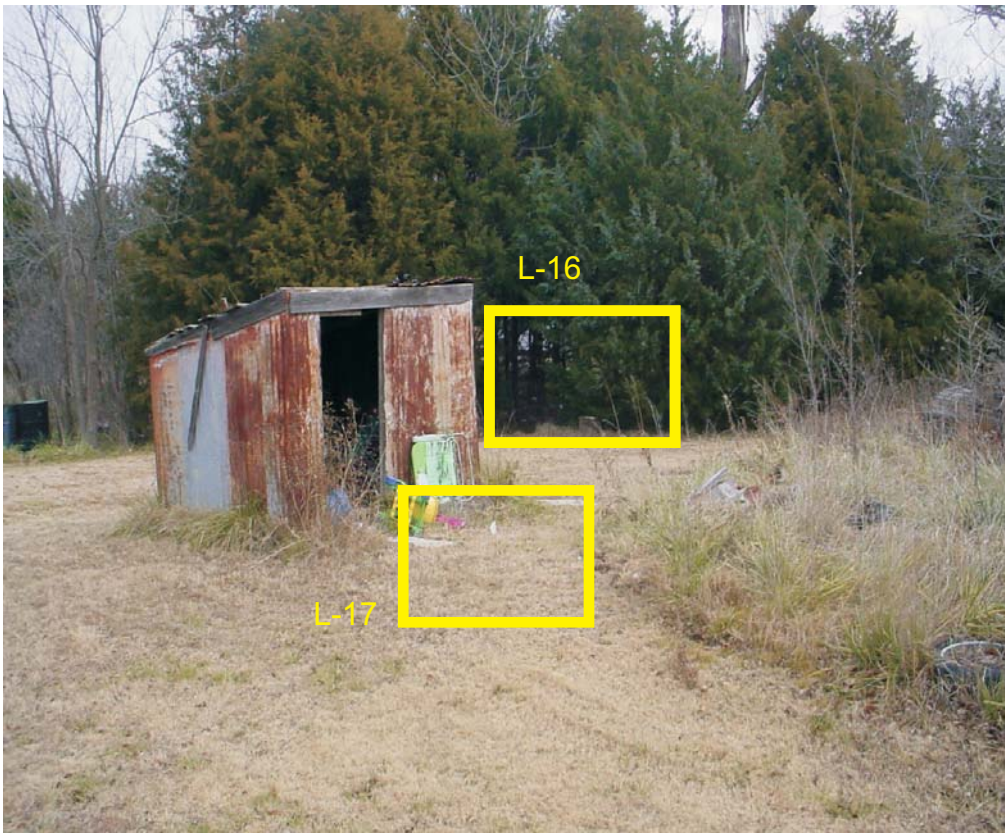


Photo 9
View: North
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-16 and L-17 soil sample locations.

Photo 10
View: East
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-11 and L-12 soil sample locations.

Caney Smelter Complaint
Integrated Assessment

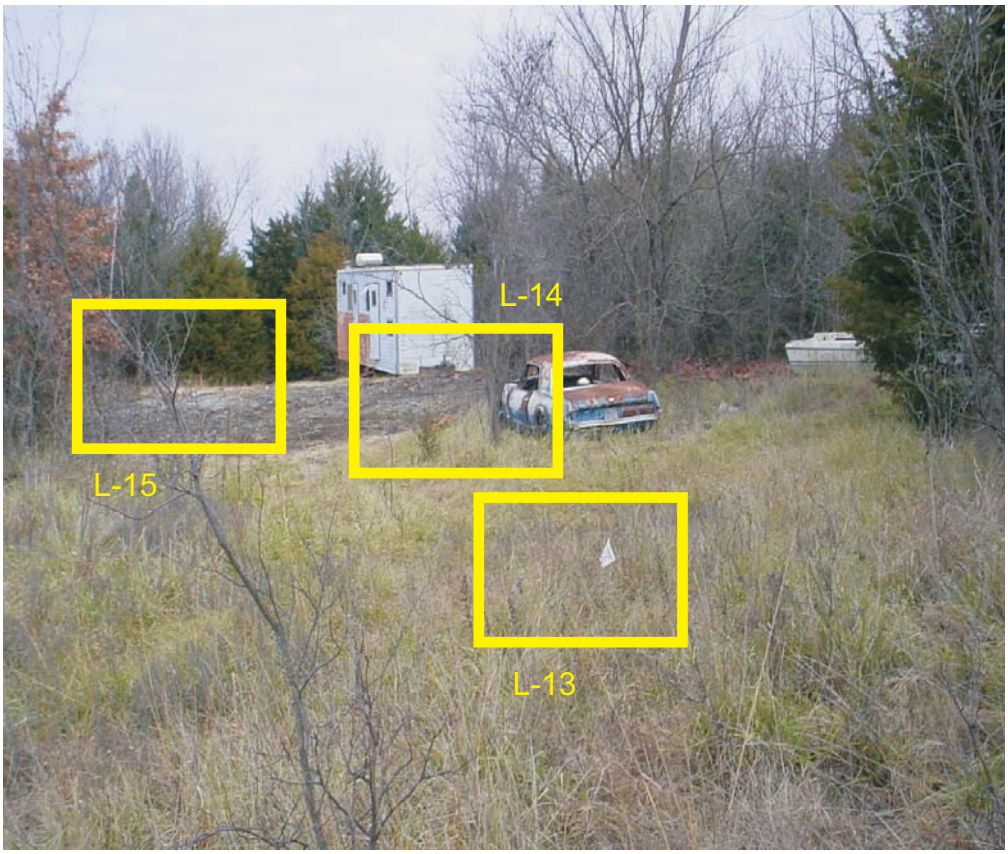


Photo 11
View: North
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-13, L-14, and L-15 soil sample locations.

Photo 12
View: North
Date: 12/10/2014
Photo by: Randy Brown
Comments: Glass waste near L-15 soil sample location.

Caney Smelter Complaint
Integrated Assessment

Photo 13
View: Northeast
Date: 12/10/2014
Photo by: Randy Brown
Comments: Abandoned trailer at site near L-15 soil sample location.

Photo 14
View: East
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-18 soil sample location.

Caney Smelter Complaint
Integrated Assessment

Photo 15
View: Northeast
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-19 soil sample location.

Photo 16
View: East
Date: 12/10/2014
Photo by: Randy Brown
Comments: L-20 soil sample location.

Caney Smelter Complaint
Integrated Assessment

Photo 17
View: South
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-21 soil sample location.

Photo 18
View: Southeast
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-22 soil sample location.

Caney Smelter Complaint
Integrated Assessment

Photo 19
View: Southeast
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-23 soil sample location.

Photo 20
View: East
Date: 12/17/2014
Photo by: Former glass plant foundations.

Caney Smelter Complaint
Integrated Assessment

Photo 21
View: Southeast
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-24 soil sample location.

Photo 22
View: Southwest
Date: 12/17/2014
Photo by: Soil sample location L-25 near former glass plant furnace foundations.

Caney Smelter Complaint
Integrated Assessment

Photo 23
View: Southeast
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-26 soil sample location. Off-site pond is visible in the background.

Photo 24
View: Southeast
Date: 12/17/2014
Photo by: Soil sample location L-27 near former glass plant foundations.

Caney Smelter Complaint
Integrated Assessment

Photo 25
View: West
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-28 soil sample location.

Photo 26
View: Southeast
Date: 12/17/2014
Photo by: Soil sample location L-29.

Caney Smelter Complaint
Integrated Assessment

Photo 27
View: Northeast
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-30 soil sample location.

Photo 28
View: Northwest
Date: 12/17/2014
Photo by: Soil sample location L-31.

Caney Smelter Complaint
Integrated Assessment

Photo 29
View: East
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-32 soil sample location.

Photo 30
View: West
Date: 12/17/2014
Photo by: Soil sample location L-33.

Caney Smelter Complaint
Integrated Assessment

Photo 31
View: North
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-34 soil sample location.

Photo 32
View: West
Date: 12/17/2014
Photo by: Soil sample location L-35.

Caney Smelter Complaint
Integrated Assessment

Photo 33
View: Northwest
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-36 soil sample location. Mr. Layton's former hog pen is visible in background.

Photo 34
View: West
Date: 12/17/2014
Photo by: Soil sample location L-37.

Caney Smelter Complaint
Integrated Assessment

Photo 35
View: Southwest
Date: 12/17/2014
Photo by: Randy Brown
Comments: L-38 soil sample location.

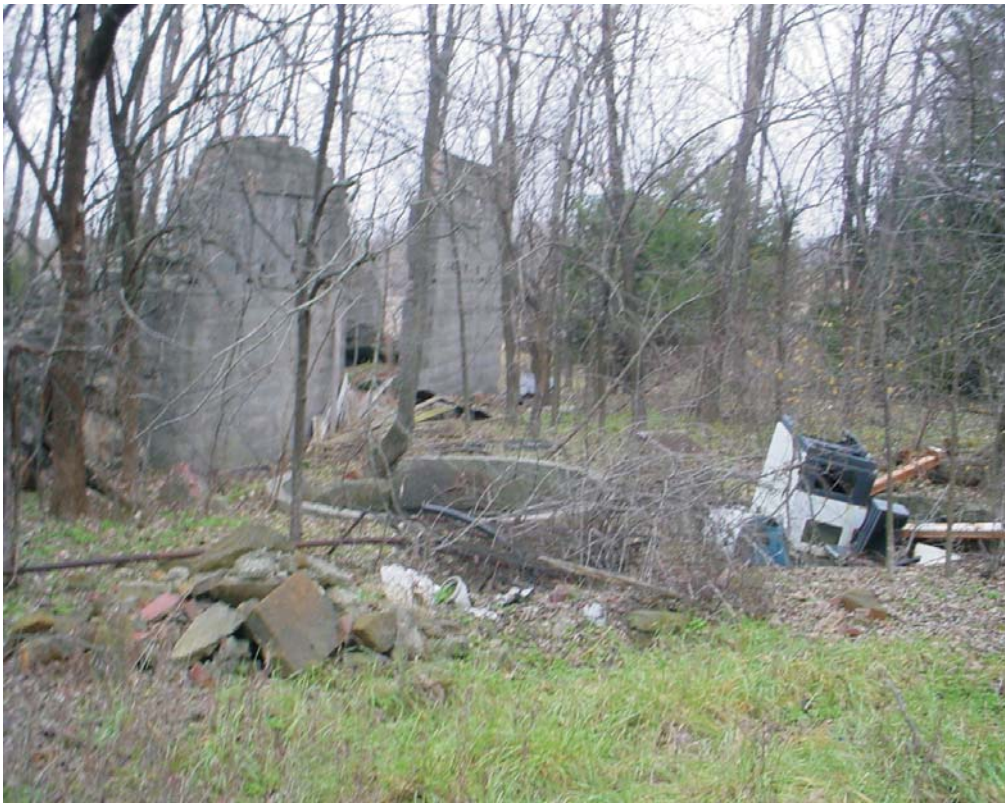


Photo 36
View: South
Date: 12/17/2014
Photo by: Foundations and cistern of former glass plant.

Caney Smelter Complaint
Integrated Assessment

Photo 39
View: Southeast
Date: 12/10/2014
Photo by: Randy Brown
Comments: Foundations of former glass plant along eastern site boundary.

Photo 40
View: Northwest
Date: 12/10/2014
Photo by: Foundations of former glass plant.

Caney Smelter Complaint
Integrated Assessment

Photo 41
View: Southeast
Date: 12/10/2014
Photo by: Randy Brown
Comments: Foundations of former glass plant.

Photo 42
View: Southeast
Date: 12/10/2014
Photo by: Foundations of former glass plant.

11.3 Laboratory Data

Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date and Time Received: 02/02/2015 1145
Continental File No.: 5962
Continental Order No.: 124098
Project ID: CAWEY
Purchase Auth: 36773

Dear Mr. Brown:

This laboratory report, containing the samples indicated below, includes 18 pages for the analytical report, 2 page(s) for the chain of custody and/or analysis request, and 1 page(s) for the sample receipt form.

CAS LAB ID #	SAMPLE DESCRIPTION	SAMPLE TYPE	DATE SAMPLED
15020018	B6-1	Solid	12/17/2014
15020019	B6-2	Solid	12/17/2014
15020020	B6-3	Solid	12/17/2014
15020021	L-10	Solid	12/10/2014
15020022	L-15	Solid	12/10/2014
15020023	L-3	Solid	12/10/2014
15020024	L-18	Solid	12/10/2014
15020025	L-19	Solid	12/10/2014
15020026	L-33	Solid	12/17/2014
15020027	L-25	Solid	12/17/2014
15020028	Rinsate	Liquid	12/15/2014

The Appendix and Quality Control sections are integral parts of this laboratory report and may contain important data qualifiers.

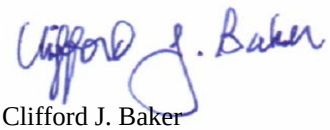
All results are reported on a wet weight basis unless otherwise stated.

Samples will be retained for 180 days unless Continental is otherwise notified.

Continental is accredited by the State of Kansas through the National Environmental Laboratory Accreditation Program (NELAP). The results contained in this report were obtained using Continental's Standard Operating Procedures. These procedures are in substantial compliance with the approved methods referenced and the standards published by NELAP unless otherwise noted in the Appendix and Quality Control sections of this report.

Thank you for choosing Continental for this project.

CONTINENTAL ANALYTICAL SERVICES, INC.



Clifford J. Baker
Technical Manager

Gregory J. Groene
Project Manager

Sample Results

Client: Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Lab Number: 15020018
Sample Description: B6-1

Date Sampled: 12/17/2014
Time Sampled: 1130

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Arsenic, Total, ICP	5	mg/kg	5.0	3	7443/178
Barium, Total, ICP	142 QC	mg/kg	5.0	3	7443/178
Cadmium, Total, ICP	2	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	11.4	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	41	mg/kg	5.0	2	7443/178
Selenium, Total, ICP	ND(3) M	mg/kg	5.0	3	7443/178
Silver, Total, ICP	1.1	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	218	mg/kg	1.0	1.0	7443/177

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1218	150206-2	2IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/10/15 1218	150206-2	2IP4041	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1218	150206-2	2IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2203	150206-2	7IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/10/15 1218	150206-2	2IP4041	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/10/15 1218	150206-2	2IP4041	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2203	150206-2	7IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/06/15 2203	150206-2	7IP4037	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 15020018

Lab Number: 15020019
Sample Description: B6-2

Date Sampled: 12/17/2014
Time Sampled: 1140

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Arsenic, Total, ICP	6.6	mg/kg	5.0	3	7443/178
Barium, Total, ICP	67.6	mg/kg	1.0	0.5	7443/177
Cadmium, Total, ICP	ND(1) M	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	8.9	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	84.7	mg/kg	5.0	2	7443/178
Selenium, Total, ICP	ND(3) M	mg/kg	5.0	3	7443/178
Silver, Total, ICP	1.1	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	208	mg/kg	1.0	1.0	7443/177

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)

-Continued-

Sample Results

Client: Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1247	150206-2	3IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/06/15 2233	150206-2	8IP4037	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1247	150206-2	3IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2233	150206-2	8IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/10/15 1247	150206-2	3IP4041	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/10/15 1247	150206-2	3IP4041	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2233	150206-2	8IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/06/15 2233	150206-2	8IP4037	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 15020019

Lab Number: 15020020
Sample Description: B6-3

Date Sampled: 12/17/2014
Time Sampled: 1150

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Arsenic, Total, ICP	19	mg/kg	5.0	3	7443/178
Barium, Total, ICP	74.8	mg/kg	1.0	0.5	7443/177
Cadmium, Total, ICP	2	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	10.1	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	17.4	mg/kg	1.0	0.3	7443/177
Selenium, Total, ICP	ND(0.5)	mg/kg	1.0	0.5	7443/177
Silver, Total, ICP	0.8	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	93.1	mg/kg	1.0	1.0	7443/177

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1251	150206-2	3IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/06/15 2237	150206-2	8IP4037	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1251	150206-2	3IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2237	150206-2	8IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/06/15 2237	150206-2	8IP4037	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/06/15 2237	150206-2	8IP4037	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2237	150206-2	8IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/06/15 2237	150206-2	8IP4037	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 15020020

Client: Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Lab Number: 15020021
Sample Description: L-10

Date Sampled: 12/10/2014
Time Sampled: 1310

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Arsenic, Total, ICP	24	mg/kg	5.0	3	7443/178
Barium, Total, ICP	101	mg/kg	5.0	3	7443/178
Cadmium, Total, ICP	10.	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	14.5	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	633	mg/kg	1.0	0.3	7443/177
Selenium, Total, ICP	ND(0.5)	mg/kg	1.0	0.5	7443/177
Silver, Total, ICP	4.1	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	4220	mg/kg	50	50	7443/179

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1256	150206-2	3IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/10/15 1256	150206-2	3IP4041	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1256	150206-2	3IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2242	150206-2	8IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/06/15 2242	150206-2	8IP4037	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/06/15 2242	150206-2	8IP4037	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2242	150206-2	8IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/11/15 1611	150206-2	2IP4042	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 15020021

Lab Number: 15020022
Sample Description: L-15

Date Sampled: 12/10/2014
Time Sampled: 1300

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Arsenic, Total, ICP	10.	mg/kg	5.0	3	7443/178
Barium, Total, ICP	95.1	mg/kg	5.0	3	7443/178
Cadmium, Total, ICP	39	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	18.6	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	220.	mg/kg	1.0	0.3	7443/177
Selenium, Total, ICP	ND(0.5)	mg/kg	1.0	0.5	7443/177
Silver, Total, ICP	3.7	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	7800	mg/kg	50	50	7443/179

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)

-Continued-

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Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1300	150206-2	3IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/10/15 1300	150206-2	3IP4041	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1300	150206-2	3IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2246	150206-2	8IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/06/15 2246	150206-2	8IP4037	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/06/15 2246	150206-2	8IP4037	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2246	150206-2	8IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/11/15 1615	150206-2	2IP4042	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 15020022

Lab Number: 15020023
Sample Description: L-3

Date Sampled: 12/10/2014
Time Sampled: 0925

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Arsenic, Total, ICP	30.	mg/kg	5.0	3	7443/178
Barium, Total, ICP	128	mg/kg	1.0	0.5	7443/177
Cadmium, Total, ICP	25	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	12.8	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	309	mg/kg	1.0	0.3	7443/177
Selenium, Total, ICP	ND(0.5)	mg/kg	1.0	0.5	7443/177
Silver, Total, ICP	2.1	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	2300	mg/kg	50	50	7443/179

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1304	150206-2	3IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/06/15 2250	150206-2	8IP4037	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1304	150206-2	3IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2250	150206-2	8IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/06/15 2250	150206-2	8IP4037	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/06/15 2250	150206-2	8IP4037	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2250	150206-2	8IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/11/15 1619	150206-2	2IP4042	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 15020023

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Suite 410
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Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Lab Number: 15020024
Sample Description: L-18

Date Sampled: 12/10/2014
Time Sampled: 1140

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Lead, TCLP	3.50	mg/L	1.0	0.05	7443/176
Arsenic, Total, ICP	42	mg/kg	5.0	3	7443/178
Barium, Total, ICP	252	mg/kg	5.0	3	7443/178
Cadmium, Total, ICP	50.5	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	17	mg/kg	5.0	3	7443/179
Lead, Total, ICP	3230	mg/kg	5.0	2	7443/178
Selenium, Total, ICP	ND(3) M	mg/kg	5.0	3	7443/178
Silver, Total, ICP	5	mg/kg	3.98	2	7443/181
Zinc, Total, ICP	28200	mg/kg	50	50	7443/179

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Lead, TCLP	02/05/15 0813	02/05/15 1836	150205-1	7IP4036	KMW	6010B
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1308	150206-2	3IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/10/15 1308	150206-2	3IP4041	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1308	150206-2	3IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/11/15 1632	150206-2	3IP4042	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/10/15 1308	150206-2	3IP4041	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/10/15 1308	150206-2	3IP4041	KMW	6010B
Silver, Total, ICP	02/12/15 0726	02/13/15 2222	150212-2	10IP4044	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/11/15 1636	150206-2	3IP4042	KMW	6010B
TCLP Preparation	02/04/15 1455		150204-1		JDL	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3010A

Conclusion of Lab Number: 15020024

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Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Lab Number: 15020025
Sample Description: L-19

Date Sampled: 12/10/2014
Time Sampled: 1215

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Lead, TCLP	2.26	mg/L	1.0	0.05	7443/176
Arsenic, Total, ICP	59.5	mg/kg	5.0	3	7443/178
Barium, Total, ICP	346	mg/kg	5.0	3	7443/178
Cadmium, Total, ICP	72.2	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	34	mg/kg	5.0	3	7443/178
Lead, Total, ICP	5570	mg/kg	50	20	7443/179
Selenium, Total, ICP	3	mg/kg	5.0	3	7443/178
Silver, Total, ICP	9	mg/kg	3.99	2	7443/181
Zinc, Total, ICP	29800	mg/kg	50	50	7443/179

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Lead, TCLP	02/05/15 0813	02/05/15 1840	150205-1	7IP4036	KMW	6010B
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1320	150206-2	4IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/10/15 1320	150206-2	4IP4041	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1320	150206-2	4IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/10/15 1320	150206-2	4IP4041	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/11/15 1644	150206-2	3IP4042	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/10/15 1320	150206-2	4IP4041	KMW	6010B
Silver, Total, ICP	02/12/15 0726	02/13/15 2230	150212-2	10IP4044	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/11/15 1644	150206-2	3IP4042	KMW	6010B
TCLP Preparation	02/04/15 1455		150204-1		JDL	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3010A

Conclusion of Lab Number: 15020025

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Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Lab Number: 15020026
Sample Description: L-33

Date Sampled: 12/17/2014
Time Sampled: 1105

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Lead, TCLP	9.59	mg/L	1.0	0.05	7443/176
Arsenic, Total, ICP	50.5	mg/kg	5.0	3	7443/178
Barium, Total, ICP	151	mg/kg	1.0	0.5	7443/177
Cadmium, Total, ICP	22	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	10.1	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	1930	mg/kg	5.0	2	7443/178
Selenium, Total, ICP	ND(0.5)	mg/kg	1.0	0.5	7443/177
Silver, Total, ICP	3.9	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	10900	mg/kg	50	50	7443/179

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Lead, TCLP	02/05/15 0813	02/05/15 1844	150205-1	7IP4036	KMW	6010B
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1325	150206-2	4IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/06/15 2303	150206-2	8IP4037	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1325	150206-2	4IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2303	150206-2	8IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/10/15 1325	150206-2	4IP4041	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/06/15 2303	150206-2	8IP4037	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2303	150206-2	8IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/11/15 1648	150206-2	3IP4042	KMW	6010B
TCLP Preparation	02/04/15 1455		150204-1		JDL	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3010A

Conclusion of Lab Number: 15020026

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Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Lab Number: 15020027
Sample Description: L-25

Date Sampled: 12/17/2014
Time Sampled: 1120

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Lead, TCLP	1.54	mg/L	1.0	0.05	7443/176
Arsenic, Total, ICP	14	mg/kg	5.0	3	7443/178
Barium, Total, ICP	90.5	mg/kg	1.0	0.5	7443/177
Cadmium, Total, ICP	35	mg/kg	5.0	1	7443/178
Chromium, Total, ICP	13.9	mg/kg	1.0	0.5	7443/177
Lead, Total, ICP	3110	mg/kg	5.0	2	7443/178
Selenium, Total, ICP	1.3	mg/kg	1.0	0.5	7443/177
Silver, Total, ICP	3.5	mg/kg	1.0	0.5	7443/177
Zinc, Total, ICP	23200	mg/kg	50	50	7443/179

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Lead, TCLP	02/05/15 0813	02/05/15 1848	150205-1	7IP4036	KMW	6010B
Arsenic, Total, ICP	02/06/15 0645	02/10/15 1329	150206-2	4IP4041	KMW	6010B
Barium, Total, ICP	02/06/15 0645	02/06/15 2307	150206-2	8IP4037	KMW	6010B
Cadmium, Total, ICP	02/06/15 0645	02/10/15 1329	150206-2	4IP4041	KMW	6010B
Chromium, Total, ICP	02/06/15 0645	02/06/15 2307	150206-2	8IP4037	KMW	6010B
Lead, Total, ICP	02/06/15 0645	02/10/15 1329	150206-2	4IP4041	KMW	6010B
Selenium, Total, ICP	02/06/15 0645	02/06/15 2307	150206-2	8IP4037	KMW	6010B
Silver, Total, ICP	02/06/15 0645	02/06/15 2307	150206-2	8IP4037	KMW	6010B
Zinc, Total, ICP	02/06/15 0645	02/11/15 1653	150206-2	3IP4042	KMW	6010B
TCLP Preparation	02/04/15 1455		150204-1		JDL	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3010A

Conclusion of Lab Number: 15020027

Client: Kansas Dept. of Health & Environment
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Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Lab Number: 15020028
Sample Description: Rinsate

Date Sampled: 12/15/2014
Time Sampled: 0730

Analysis	Concentration	Units	Dilution Factor	LOQ	Book/Page
Arsenic, Total, ICP	ND(5)	µg/L	1.0	5	7443/174
Barium, Total, ICP	ND(5)	µg/L	1.0	5	7443/174
Cadmium, Total, ICP	ND(2)	µg/L	1.0	2	7443/174
Chromium, Total, ICP	ND(5)	µg/L	1.0	5	7443/174
Lead, Total, ICP	ND(3)	µg/L	1.0	3	7443/174
Selenium, Total, ICP	ND(5)	µg/L	1.0	5	7443/175
Silver, Total, ICP	ND(5)	µg/L	1.0	5	7443/174
Zinc, Total, ICP	ND(10)	µg/L	1.0	10	7443/174

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Arsenic, Total, ICP	02/03/15 0636	02/04/15 1639	150203-1	7IP4035	KMW	6010B
Barium, Total, ICP	02/03/15 0636	02/04/15 1639	150203-1	7IP4035	KMW	6010B
Cadmium, Total, ICP	02/03/15 0636	02/04/15 1639	150203-1	7IP4035	KMW	6010B
Chromium, Total, ICP	02/03/15 0636	02/04/15 1639	150203-1	7IP4035	KMW	6010B
Lead, Total, ICP	02/03/15 0636	02/04/15 1639	150203-1	7IP4035	KMW	6010B
Selenium, Total, ICP	02/03/15 0636	02/05/15 1442	150203-1	2IP4036	KMW	6010B
Silver, Total, ICP	02/03/15 0636	02/04/15 1639	150203-1	7IP4035	KMW	6010B
Zinc, Total, ICP	02/03/15 0636	02/04/15 1639	150203-1	7IP4035	KMW	6010B
ICP Metals Total Preparation Method						3010A

Conclusion of Lab Number: 15020028

Appendix

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Date Reported: 02/16/2015
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Continental File No: 5962
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ND indicates not detected with the LOQ (Limit of Quantitation) in parentheses. The LOQ value has been adjusted for the dilution factor and percent solids, as applicable. Due to rounding of significant figures, the LOQ value may vary slightly from the reported concentration. The LOQ is the lowest concentration of the analytical standard that was used for calibrating the instrument. If an analytical standard is analyzed at the LOQ, an error of as much as +/- 50% can be expected. N/A, if present, indicates Not Applicable.

All samples which require cooling were received at a temperature of less than 6 degrees Celsius.

No analysis with a holding time of seventy-two hours or less was performed in this Continental order.

QC - QC data qualifiers were noted. See the Quality Control Report.

M - The Limit of Quantitation (LOQ) is higher than normal due to matrix interferences.

Accreditation Summary

Client: Kansas Dept. of Health & Environment
Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
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NELAP accreditation is issued under each EPA regulatory program for a given matrix/analyte/method combination. Continental is NELAP accredited for each matrix/analyte/method and EPA program cited in this Laboratory Report, except for those listed in the table below and for analyses performed in the field. For most of the analyses listed in the table, NELAP accreditation is not offered under the listed EPA program and Continental is NELAP accredited for the analysis, using the same analytical technology, but under a different EPA program. Continental's full NELAP accreditation status may be viewed at www.kdheks.gov/envlab. Note that unless qualified otherwise in the Laboratory Report, Continental performs all analyses, including each analysis listed in the table below, utilizing NELAP protocol.

Test	Analysis	Matrix-Regulatory Program	Method	CAS NELAP Accredited in Other Reg. Program

CAS is accredited for all analytes.

Quality Control Report
Batch Summary

Client: Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Test Code	Testname	QC Batch	Method Blank Date/Time Analyzed	LCS Date/Time Analyzed	MS Lab No. Date/Time Analyzed
SL728	Lead, TCLP	150205-1	150205BLK1 02/05/15 1734	150205LCS1 02/05/15 1738	15011577MS 02/05/15 1820
Lab numbers associated with this batch: 15020024 15020025 15020026 15020027					
SL802	Arsenic, Total, ICP	150203-1	150203BLK1 02/04/15 1511	150203LCS1 02/04/15 1516	
Lab numbers associated with this batch: 15020028					
SL303	Barium, Total, ICP	150203-1	150203BLK1 02/04/15 1511	150203LCS1 02/04/15 1516	15011643MS 02/04/15 1545
Lab numbers associated with this batch: 15020028					
SL306	Cadmium, Total, ICP	150203-1	150203BLK1 02/04/15 1511	150203LCS1 02/04/15 1516	
Lab numbers associated with this batch: 15020028					
SL308	Chromium, Total, ICP	150203-1	150203BLK1 02/04/15 1511	150203LCS1 02/04/15 1516	15011643MS 02/04/15 1545
Lab numbers associated with this batch: 15020028					
SL311	Lead, Total, ICP	150203-1	150203BLK1 02/04/15 1511	150203LCS1 02/04/15 1516	
Lab numbers associated with this batch: 15020028					
SL353	Silver, Total, ICP	150203-1	150203BLK1 02/04/15 1511	150203LCS1 02/04/15 1516	
Lab numbers associated with this batch: 15020028					
SL369	Zinc, Total, ICP	150203-1	150203BLK1 02/04/15 1511	150203LCS1 02/04/15 1516	15011643MS 02/04/15 1545
Lab numbers associated with this batch: 15020028					
SL850	Selenium, Total, ICP	150203-1	150203BLK1 02/05/15 1433	150203LCS1 02/05/15 1437	
Lab numbers associated with this batch: 15020028					
SL601	TCLP Prep	150204-1	N/A	N/A	
Lab numbers associated with this batch: 15020024 15020025 15020026 15020027					

Quality Control Report
Batch Summary

Client: Kansas Dept. of Health & Environment
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Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Test Code	Testname	QC Batch	Method Blank Date/Time Analyzed	LCS Date/Time Analyzed	MS Lab No. Date/Time Analyzed
SL303	Barium, Total, ICP	150206-2	150206BLK2 02/06/15 2155	150206LCS2 02/06/15 2159	15020018MS 02/10/15 1231
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020024 15020025 15020026 15020027					
SL308	Chromium, Total, ICP	150206-2	150206BLK2 02/06/15 2155	150206LCS2 02/06/15 2159	15020018MS 02/06/15 2207
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020024 15020025 15020026 15020027					
SL311	Lead, Total, ICP	150206-2	150206BLK2 02/06/15 2155	150206LCS2 02/06/15 2159	15020018MS 02/10/15 1231
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020024 15020025 15020026 15020027					
SL850	Selenium, Total, ICP	150206-2	150206BLK2 02/06/15 2155	150206LCS2 02/06/15 2159	15020018MS 02/10/15 1231
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020024 15020025 15020026 15020027					
SL353	Silver, Total, ICP	150206-2	150206BLK2 02/06/15 2155	150206LCS2 02/06/15 2159	15020018MS 02/06/15 2207
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020026 15020027					
SL369	Zinc, Total, ICP	150206-2	150206BLK2 02/06/15 2155	150206LCS2 02/06/15 2159	15020018MS 02/06/15 2207
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020024 15020025 15020026 15020027					
SL802	Arsenic, Total, ICP	150206-2	150206BLK2 02/10/15 1210	150206LCS2 02/10/15 1214	15020018MS 02/10/15 1231
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020024 15020025 15020026 15020027					
SL306	Cadmium, Total, ICP	150206-2	150206BLK2 02/10/15 1210	150206LCS2 02/10/15 1214	15020018MS 02/10/15 1231
Lab numbers associated with this batch: 15020018 15020019 15020020 15020021 15020022 15020023 15020024 15020025 15020026 15020027					
SL353	Silver, Total, ICP	150212-2	150212BLK2 02/13/15 2214	150212LCS2 02/13/15 2218	15020584MS 02/13/15 2243
Lab numbers associated with this batch: 15020024 15020025					

Quality Control Report
Method Blank, LCS, MS/MSD Data

Client: Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Analysis	Method Blank	LCS % Rec	LCS Limits	LCS Spike Level	Units	Spiked Sample (% Recovery) MS	MSD	MS/MSD Limits	MS/MSD Spike Level	Units	Spiked Sample Precision Data RPD	Limit
QC Batch: 150203-1	**For samples prepared on: 02/03/2015 0636**					**Spiked sample:**						
Arsenic, Total, ICP	ND(5)	99.8	80.0-120	500	µg/L	MN	MN	80.0-120	N/A	µg/L	**	20.0
Cadmium, Total, ICP	ND(2)	97.3	80.0-120	500	µg/L	MN	MN	80.0-120	N/A	µg/L	**	20.0
Lead, Total, ICP	ND(3)	96.7	80.0-120	500	µg/L	MN	MN	80.0-120	N/A	µg/L	**	20.0
Selenium, Total, ICP	ND(5)	95.0	80.0-120	500	µg/L	MN	MN	80.0-120	N/A	µg/L	**	20.0
Silver, Total, ICP	ND(5)	99.1	80.0-120	100	µg/L	MN	MN	80.0-120	N/A	µg/L	**	20.0
QC Batch: 150203-1	**For samples prepared on: 02/03/2015 0636**					**Spiked sample: 15011643**						
Barium, Total, ICP	ND(1) J	103	80.0-120	1500	µg/L	MN	MN	80.0-120	1500	µg/L	**	20.0
Chromium, Total, ICP	ND(2) J	99.2	80.0-120	500	µg/L	MN	MN	80.0-120	500	µg/L	**	20.0
Zinc, Total, ICP	6 J	96.4	80.0-120	500	µg/L	MN	MN	80.0-120	500	µg/L	**	20.0
QC Batch: 150205-1	**For samples prepared on: 02/05/2015 0648**					**Spiked sample: 15011577**						
Lead, TCLP	ND(0.005)	98.4	80.0-120	0.50	mg/L	MN	MN	80.0-120	5.0	mg/L	**	20.0
QC Batch: 150206-2	**For samples prepared on: 02/06/2015 0645**					**Spiked sample: 15020018**						
Arsenic, Total, ICP	ND(0.5)	98.8	80.0-120	25.0	mg/kg	91.8	95.6	75.0-125	25.0	mg/kg	3.30	20.0
Barium, Total, ICP	ND(0.5)	104	80.0-120	75.0	mg/kg	61.7 ML	55.6 ML	75.0-125	75.0	mg/kg	2.50	20.0
Cadmium, Total, ICP	ND(0.2)	97.2	80.0-120	25.0	mg/kg	90.8	91.7	75.0-125	25.0	mg/kg	0.80	20.0
Chromium, Total, ICP	ND(0.5)	99.4	80.0-120	25.0	mg/kg	89.0	85.6	75.0-125	25.0	mg/kg	2.60	20.0
Lead, Total, ICP	ND(0.3)	97.2	80.0-120	25.0	mg/kg	94.3	101	75.0-125	25.0	mg/kg	2.30	20.0
Selenium, Total, ICP	ND(0.5)	96.8	80.0-120	25.0	mg/kg	92.8	93.5	75.0-125	25.0	mg/kg	0.80	20.0
Silver, Total, ICP	ND(0.5)	101	80.0-120	5.0	mg/kg	98.2	97.1	75.0-125	5.0	mg/kg	0.90	20.0
Zinc, Total, ICP	ND(1.0)	96.8	80.0-120	25.0	mg/kg	I	I	75.0-125	25.0	mg/kg	**	20.0
QC Batch: 150212-2	**For samples prepared on: 02/12/2015 0726**					**Spiked sample: 15020584**						
Silver, Total, ICP	ND(0.5)	101	80.0-120	5.0	mg/kg	MN	MN	75.0-125	10.0	mg/kg	**	20.0

Data Qualifiers:

MN - The MS/MSD sample analyses were not performed on a sample from this Continental order number.

J - The concentration or not detected (ND) value is below the Limit of Quantitation (LOQ) and is considered an estimated value.

ML - The matrix spike and/or matrix spike duplicate recovery for this analyte was below the method or laboratory control limit. See LCS data for the basis for acceptance of this sample. The reported sample concentration is estimated.

I - Due to the concentration of analyte in the sample, the spike level is too low to allow accurate quantification of the spike recovery.

** - RPD calculation not applicable/not available for this analysis.

Client: Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Analysis	Date of Analysis	Instrument Batch ID	Amount in Standard	Amount Detected	Units	Percent Recovery
Arsenic, Total, ICP	02/10/2015	2IP4041	CCV recovery acceptable for this Instrument Batch.			
Arsenic, Total, ICP	02/10/2015	3IP4041	CCV recovery acceptable for this Instrument Batch.			
Arsenic, Total, ICP	02/10/2015	4IP4041	CCV recovery acceptable for this Instrument Batch.			
Arsenic, Total, ICP	02/10/2015	5IP4041	CCV recovery acceptable for this Instrument Batch.			
Arsenic, Total, ICP	02/04/2015	7IP4035	CCV recovery acceptable for this Instrument Batch.			
Arsenic, Total, ICP	02/04/2015	8IP4035	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/10/2015	2IP4041	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/10/2015	3IP4041	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/10/2015	4IP4041	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/10/2015	5IP4041	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/04/2015	7IP4035	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/04/2015	8IP4035	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/06/2015	8IP4037	CCV recovery acceptable for this Instrument Batch.			
Barium, Total, ICP	02/06/2015	9IP4037	CCV recovery acceptable for this Instrument Batch.			
Cadmium, Total, ICP	02/10/2015	2IP4041	CCV recovery acceptable for this Instrument Batch.			
Cadmium, Total, ICP	02/10/2015	3IP4041	CCV recovery acceptable for this Instrument Batch.			
Cadmium, Total, ICP	02/10/2015	4IP4041	CCV recovery acceptable for this Instrument Batch.			
Cadmium, Total, ICP	02/10/2015	5IP4041	CCV recovery acceptable for this Instrument Batch.			
Cadmium, Total, ICP	02/04/2015	7IP4035	CCV recovery acceptable for this Instrument Batch.			
Cadmium, Total, ICP	02/04/2015	8IP4035	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/11/2015	3IP4042	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/10/2015	4IP4041	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/11/2015	4IP4042	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/10/2015	5IP4041	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/04/2015	7IP4035	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/06/2015	7IP4037	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/04/2015	8IP4035	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/06/2015	8IP4037	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	02/06/2015	9IP4037	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/10/2015	2IP4041	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/10/2015	3IP4041	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/11/2015	3IP4042	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/10/2015	4IP4041	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/11/2015	4IP4042	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/10/2015	5IP4041	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/04/2015	7IP4035	CCV recovery acceptable for this Instrument Batch.			
Lead, TCLP	02/05/2015	7IP4036	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/04/2015	8IP4035	CCV recovery acceptable for this Instrument Batch.			
Lead, TCLP	02/05/2015	8IP4036	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/06/2015	8IP4037	CCV recovery acceptable for this Instrument Batch.			
Lead, Total, ICP	02/06/2015	9IP4037	CCV recovery acceptable for this Instrument Batch.			
Selenium, Total, ICP	02/05/2015	2IP4036	CCV recovery acceptable for this Instrument Batch.			
Selenium, Total, ICP	02/10/2015	2IP4041	CCV recovery acceptable for this Instrument Batch.			

Client: Kansas Dept. of Health & Environment
Attn: Randy Brown
1000 SW Jackson
Suite 410
Topeka, KS 66612-1367

Date Reported: 02/16/2015
Date Received: 02/02/2015
Continental File No: 5962
Continental Order No: 124098

Selenium, Total, ICP	02/05/2015	3IP4036	CCV recovery acceptable for this Instrument Batch.
Selenium, Total, ICP	02/10/2015	3IP4041	CCV recovery acceptable for this Instrument Batch.
Selenium, Total, ICP	02/10/2015	4IP4041	CCV recovery acceptable for this Instrument Batch.
Selenium, Total, ICP	02/10/2015	5IP4041	CCV recovery acceptable for this Instrument Batch.
Selenium, Total, ICP	02/06/2015	8IP4037	CCV recovery acceptable for this Instrument Batch.
Selenium, Total, ICP	02/06/2015	9IP4037	CCV recovery acceptable for this Instrument Batch.
Silver, Total, ICP	02/13/2015	10IP4044	CCV recovery acceptable for this Instrument Batch.
Silver, Total, ICP	02/13/2015	11IP4044	CCV recovery acceptable for this Instrument Batch.
Silver, Total, ICP	02/04/2015	7IP4035	CCV recovery acceptable for this Instrument Batch.
Silver, Total, ICP	02/06/2015	7IP4037	CCV recovery acceptable for this Instrument Batch.
Silver, Total, ICP	02/04/2015	8IP4035	CCV recovery acceptable for this Instrument Batch.
Silver, Total, ICP	02/06/2015	8IP4037	CCV recovery acceptable for this Instrument Batch.
Silver, Total, ICP	02/06/2015	9IP4037	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/11/2015	2IP4042	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/11/2015	3IP4042	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/11/2015	4IP4042	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/04/2015	7IP4035	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/06/2015	7IP4037	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/04/2015	8IP4035	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/06/2015	8IP4037	CCV recovery acceptable for this Instrument Batch.
Zinc, Total, ICP	02/06/2015	9IP4037	CCV recovery acceptable for this Instrument Batch.

- Laboratory Report Conclusion -

Continental Analytical Services, Inc.

525 N. 8th, Salina, KS 67401
(785) 827-1273 or (800) 535-3076
Fax (785) 823-7830
www.cas-lab.com

NO Hg per RB via Randy 2/2/15

CHAIN OF CUSTODY RECORD

Page 1 of 2

Continental Order No.: [Lab to enter Order No.] 124098

Client/Reporting Information

Company Name: KDHE
Address: 1000 SW JACKSON ST STE 410
City: TOPEKA State: KS Zip: 66612
Contact: RANDY BROWN
E-mail: rbrown@kdheks.gov
Phone: 785-296-8065 Fax:
File No. / Project No.: Project Name: CAWEY
Sampled by (Print): RANDY BROWN Sampled by (Signature):

Client Invoice Information

Company Name: KDHE
Address:
City: State: Zip:
Contact: TERESA HATTAN
E-mail:
Phone: Fax:
Purchase Order:

Requested Test (s)

Comments

Is dry weight required ? Write *Dry Wt.* in this column for applicable samples. See (3) below.

Is Rush or Emergency TAT required ? Write *Rush* or *Emerg* in this column for applicable samples. See (4) below.

Sample Identification (30 characters or less - to appear on lab report)	Matrix (1)	Program (2)	DATE Sampled	TIME Sampled	G - Grab or C - Composite	Total No. of Containers	No. of Preserved Containers: HCl	NaOH	HNO_3	H_2SO_4	Not Preserved	Other :	RCRA METALS SW-846	ZINC SW-846	TCLP LEAD METHOD 1311						
B6-1	S		12/17/14	1130	6	1					X		X	X							
B6-2	S		12/17/14	1140	6	1					X		X	X							
B6-3	S		12/17/14	1150	6	1					X		X	X							
L-10	S		12/10/14	1310	6	1					X		X	X							
L-15	S		12/10/14	1300	6	1					X		X	X							
L-3	S		12/10/14	0925	6	1					X		X	X							
L-18	S		12/10/14	1140	6	1					X		X	X	X						
L-19	S		12/10/14	1215	6	1					X		X	X	X						
L-33	S		12/17/14	1105	6	1					X		X	X	X						
L-25	S		12/17/14	1120	6	1					X		X	X	X						

1. Matrix (sample type): DW = Drinking Water GW = Ground Water WW = Waste Water S = Soil / Solid SL = Sludge OL = Oil / Organic Liquid W = Wipe A = Air O = Other
2. Regulatory Program: D = Drinking Water N = NPDES R = RCRA SL = 503 Sludge O = No program applies If Regulatory Program is "O" or blank, Continental will select the test method.
3. Results will be reported on a wet weight (as received) basis unless dry weight is requested or required (503 regulation, PCB in solid, High level soil VOCs, etc.). Dry weight reporting is subject to an additional charge.
4. Turn around time (TAT): Standard TAT: 15 working days Rush TAT: 5 working days Emergency TAT: 2 - 3 working days Rush TAT and Emergency TAT are subject to an additional charge.

RELINQUISHED BY:	DATE: 02/02/15	TIME: 1145	RECEIVED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
RECEIVED AT LAB BY:	DATE: 2-2-15	TIME: 1145	SHIPPED VIA: AIR BILL:	SEAL #: SEAL DATE:	

Continental's standard *Terms and Conditions of Sale* will apply to all samples received unless a separate contractual agreement has been made. Please note the enclosed Continental *Sample Acceptance Policy*.

Continental Analytical Services, Inc.

525 N. 8th, Salina, KS 67401
(785) 827-1273 or (800) 535-3076
Fax (785) 823-7830
www.cas-lab.com

CHAIN OF CUSTODY RECORD

Page 2 of 2

No 45 per E.B. via phone 2/2/15

Continental Order No.: [Lab to enter Order No.] 124098

Client/Reporting Information	Client Invoice Information
Company Name: KDHE	Company Name: KDHE
Address: 1000 SW JACKSON, STE 410	Address:
City: TOPEKA State: KS Zip: 66612	City: State: Zip:
Contact: RANDY BROWN	Contact: TERESA HATTAN
E-mail: RBROWN@KDHEKS.GOV	E-mail:
Phone: 785-296-8066 Fax:	Phone: Fax:
File No. / Project No.:	Project Name: CANEY
Sampled by (Print): RANDY BROWN	Sampled by (Signature):
Purchase Order:	

Sample Identification (30 characters or less - to appear on lab report)	Matrix (1)	Program (2)	DATE Sampled	TIME Sampled	G - Grab or C - Composite	Total No. of Containers	No. of Preserved Containers: HCl	NaOH	HNO_3	H_2SO_4	Not Preserved	Other :	Requested Test (s): DRMA METALS SW-846	ZINC SW-846							Comments
RINSATE	WW		12/5/14	0730	X	1			X				X	X							Is dry weight required ? Write *Dry Wt.* in this column for applicable samples. See (3) below. Is Rush or Emergency TAT required ? Write *Rush* or *Emerg* in this column for applicable samples. See (4) below.

1. **Matrix (sample type):** DW = Drinking Water GW = Ground Water WW = Waste Water S = Soil / Solid SL = Sludge OL = Oil / Organic Liquid W = Wipe A = Air O = Other
2. **Regulatory Program:** D = Drinking Water N = NPDES R = RCRA SL = 503 Sludge O = No program applies If Regulatory Program is "O" or blank, Continental will select the test method.
3. Results will be reported on a wet weight (as received) basis unless dry weight is requested or required (503 regulation, PCB in solid, High level soil VOCs, etc.). Dry weight reporting is subject to an additional charge.
4. **Turn around time (TAT):** **Standard TAT**: 15 working days **Rush TAT**: 5 working days **Emergency TAT**: 2 - 3 working days **Rush TAT and Emergency TAT are subject to an additional charge.**

RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
	02/02/15	1145			
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
RECEIVED AT LAB BY:	DATE:	TIME:	SHIPPED VIA:	SEAL #:	
	2-2-15	1145	AIR BILL:	SEAL DATE:	

Continental's standard ~~*Terms and Conditions of Sale*~~ will apply to all samples received unless a separate contractual agreement has been made. Please note the enclosed Continental *Sample Acceptance Policy*.

Continental Analytical Services, Inc.
Cooler/Sample Receipt Form (C/S RF)

CAS Order No.: 124095

Client Name: KDHE **CAS File No.:** 5960

Sample ID's in cooler: See COC

Cooler 1 of 1 for this CAS Order No.

Cooler Identification: CAS Cooler #:_____ / Client's Cooler / Box / Letter / Hand-delivered
Other:_____

Date/Time Cooler Received: 2/2/15 11:45

Delivered By: UPS / FedX / AB Express / Field Svcs / Mail / Walk-In / Other:_____

Custody Seal: Present: Intact / Broken Absent: ☒ Seal No: _____
Seal Name: _____ Seal Date: _____
Seal matches Chain of Custody: Yes / No / N/A

Type of Packing Material: Blue Ice / Ice / Melted Ice / Bubble / Foam / Paper / Peanuts / Vermiculite / None / Other:_____

Cooler Temperature (°C): Original Reading (°C) 0.7 Corrected Reading (°C) 0.7
Temperature. By: Temperature Blank Surface Temperature
Thermo. ID No.: SS4 Thermo. Correction Factor (°C): 0.0

☐ Evidence of Cooling and date received = date sampled

Sample Receipt Discrepancies: ☒ No ☐ Yes **(See below for discrepancies.)**

Note: If discrepancies are present, CAS will proceed with analyses until/unless directed otherwise by the client.

☐ Chain of Custody not present - information taken from:
Cover Letter ☐ Container ☐
PO ☐ CAS Proj. Mgr. ☐
☐ Container label absent
☐ Chain of Custody incomplete [see detail below]
☐ Chain of Custody missing date/time sampled (excl. TB or Dup.)
☐ Date or Time sampled obtained from container label
☐ Chain of Custody missing sampler's name
☐ Chain of Custody missing matrix (sample type)
☐ Missing relinquished information: signature date time
☐ Sample excluded from Chain of Custody
☐ Sample listed on Chain of Custody, not received
☐ Sample identification on container and Chain of Custody do not agree
☐ Air bubbles in Aqueous VOA vials larger than pea-size [approx. 6 mm]
☐ Cooler temperature exceeded 0.1 - 6.0 °C requirement
[Do not mark if samples do not require cooling to 0.1 - 6.0 °C.]
☐ Broken or leaking containers (detail actions below)
☐ Sample container type or labeled chemical preservation inappropriate
☐ Other discrepancies: _____

Detail to discrepancies/comments:

Completed by: _____ **Date Completed:** 2.2.15

11.4 Field Notes

Sidney Smelter Complaint 12/10/2014

Brownfield-Site #875

Access granted by Mr Layton

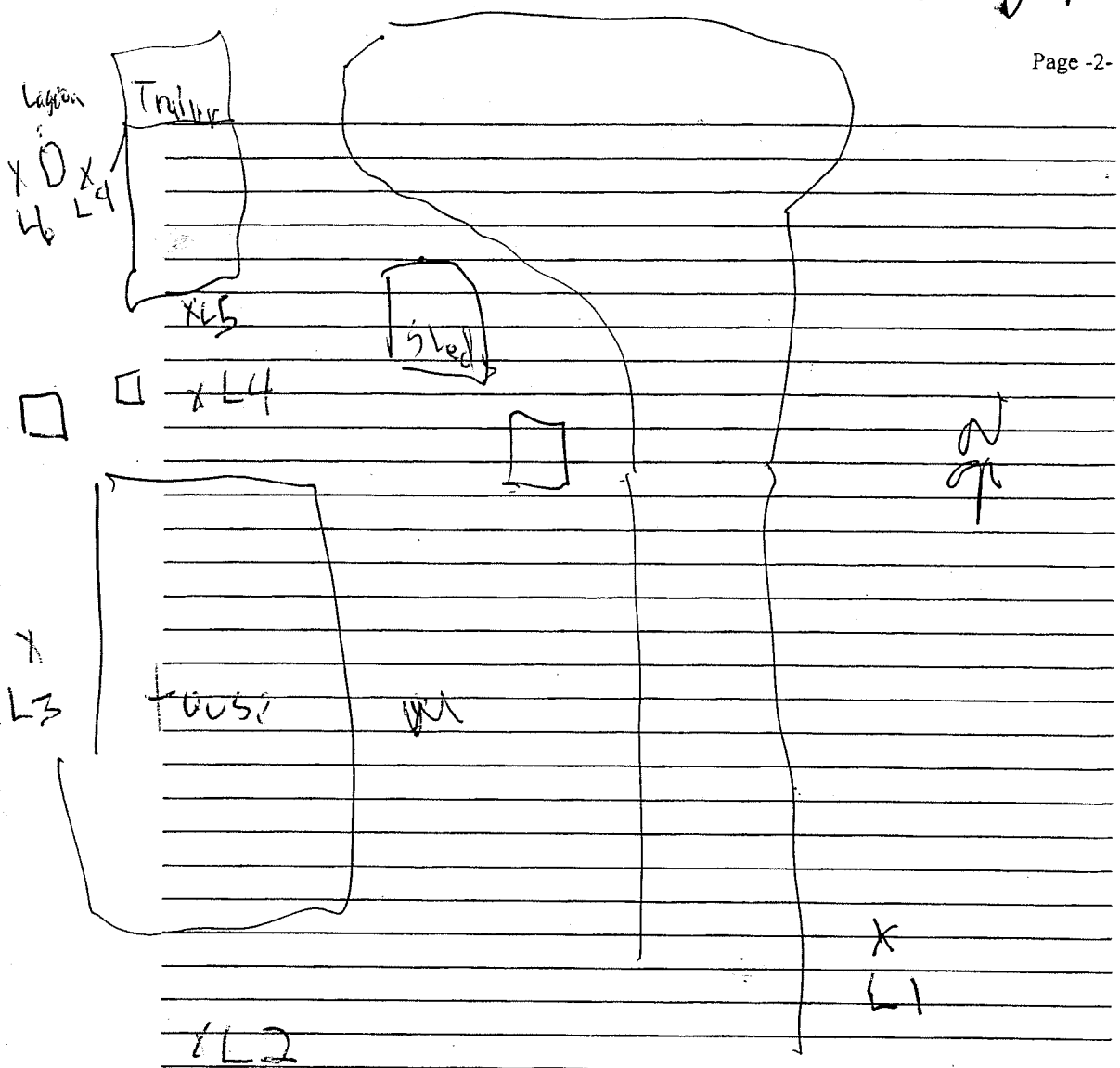
(a) check OK passed 245 e.V

In-situ 30 sec analysis x3 shots per location

Sample	Pb	Other Significant Metals
NIST 2781	2310 ± 19	
L1	774 ± 9	
	749 ± 10	
	253 ± 6	
L2	129 ± 7	
	135 ± 7	
	142 ± 7	
* L3	318 ± 11	Ex-situ 0925
	328 ± 11	
	322 ± 11	
L4	377 ± 6	
	132 ± 6	
	133 ± 6	
L5	234 ± 12	
	268 ± 10	
	277 ± 11	
L6	5045	
	74 ± 5	
	75 ± 5	
L7	97 ± 7	
	88 ± 6	
	84 ± 6	
L9	133 ± 8	
	105 ± 8	
	107 ± 8	
L8	193 ± 8	
	191 ± 8	
	187 ± 8	

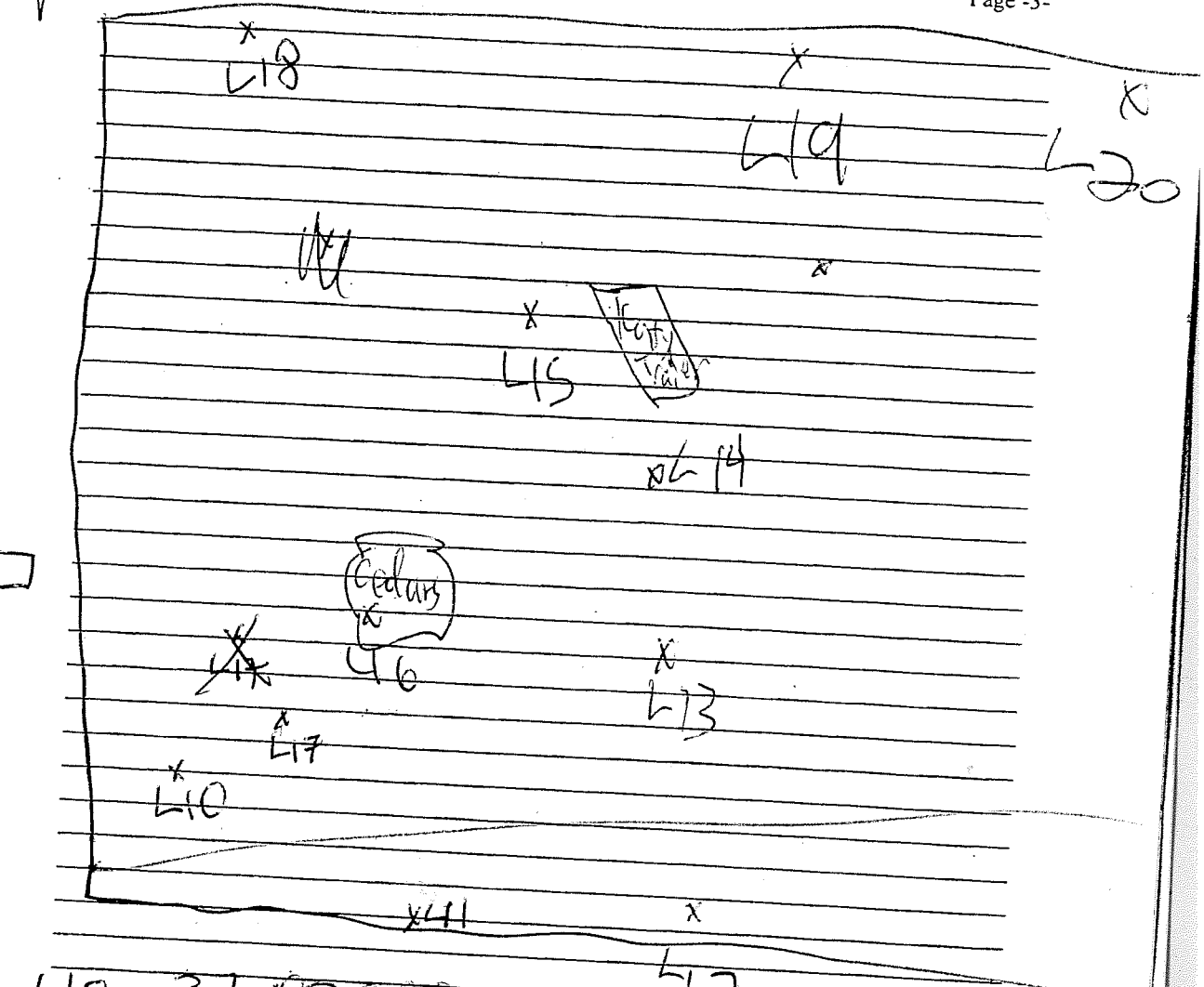
XL7 XL8

RIID 07014 pg2



L1	37.01960	-095.92143 ±5
L2	37.01957	-095.92181 ±2
L3	37.01973	-095.92200 ±6
L4	37.01984	-095.92171 ±6
L5	37.02014	-095.92170 ±4
L6	37.02042	-095.92239 ±5
L7	37.02057	-095.92165 ±7
L8	37.02048	-095.92123 ±6
L9	37.02038	-095.92184 ±7

12/10/2014



L10	37.02000	-095.92134 ± 24
L11	37.01992	-095.92113 ± 15
L12	37.01979	-095.92090 ± 16
L14	37.02017	-095.92089 ± 8
L15	37.02042	-095.92091 ± 10
L16	37.02056	-095.92101 ± 2
L17	37.02034	-095.92113 ± 13
L18	37.02024	-095.92132 ± 13
L19	37.02082	-095.92116 ± 9
L20	37.02085	-095.92084 ± 33
	37.02052	-095.92090 ± 15

small burn area never lit

12/10/2014

L10	766±18	Ex-Situ 1310	
	743±18		
	733±19		
L11	105±6		
	100±6		
	101±6		
L12	1928±20	Ex-Situ 1320	
	930±20		
	920±21		
L13	167±8		
	161±8		
	136±7		
L14	265	Lab sample Time 1330	
	216	Cd 66±14	
	19±6		
L15	317±12	Ex-Situ 1300	
	59±12		
	349±12		
L16	47±5		
	53±5		
	50±5		
L17	126±7		
	131±7		
	114±6		
L18	3915±60	Cd 96±19	Zn 25,800
	3824±68	Cd 77±20	Zn 26,100
	3769±64	Cd 69±20	Zn 25,500
RSD	3765		
	3803		
	3634		
	3801		
	3804		
	3763		
	3717		

Ex-Situ L18 1140

12/10/14

L9	3480 ± 65	Zn 22,000
	3430 ± 64	Zn 22,000
	3694 ± 365 L168	Cd 83 ± 20 Zn 23,300
	L19 Ex Silv 1215	
L20	93 ± 7	
	94 ± 7	
	96 ± 7	
NIST2781	207 ± 9	
NIST2711	1167 ± 25	
Blank	L19	

Collected samples moved to frozen bags w/ stainless steel trowel for ex-situ XRF analysis. Manually homogenized, removed visible gravel fraction.
Met M. Layton at 1340 for final meeting before leaving site

Decon w/ alconox + triple DI rinse
Rinsate 12/16/2014 1730 into 250mL HNO3 w/ digest

12/17/2014

Brown Cal site 0745
Cal check OK In-situ 3X location, 30s and 45s

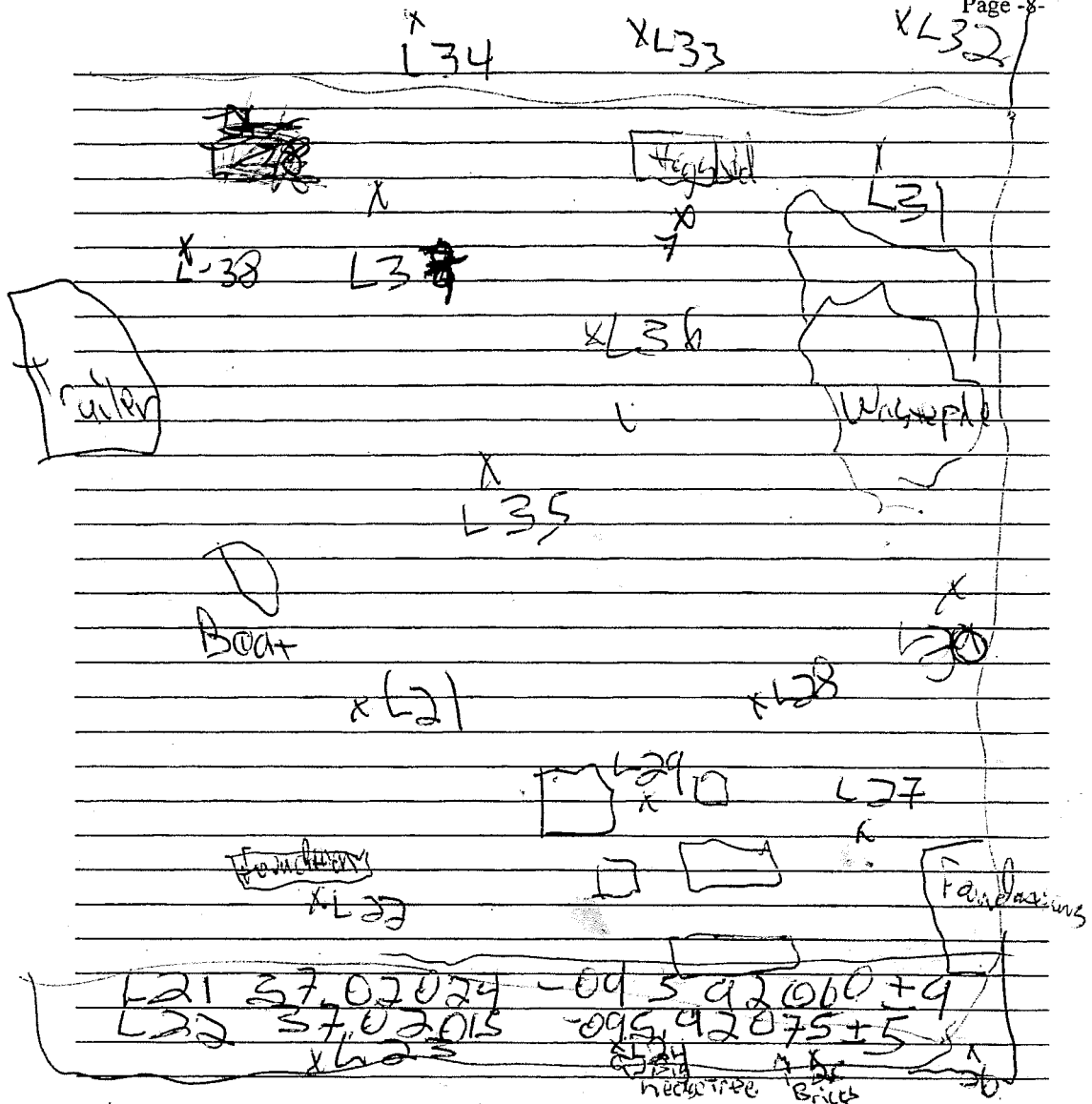
Sample	Pb
LST 2751	1497±8
L21	944±6
	980±6
	914±6
L22	163±7
	169±7
	135±7
L23	222±8
	212±7
	222±7
* L24	~~470±8~~
	567±18
	581±19
	567±19
* L25	2395±52
	2326±51
	2220±50
L26	40±3
	60±3
	26±8
* L27	766±17
	781±17
	783±17
ESD	794
	778
	823
	812
	805
	812
	787
L28	202±8
	219±8
	205±8

Other Significant Metals

by Bighatchee

2n 2760 ± 1,000

12/17/2014 Pg 2



L21	37.02024	-095.92060 ± 9
L22	37.02015	-095.92075 ± 5
L23	37.01999	-095.92071 ± 3
L24	37.01999	-095.92040 ± 13
L25	37.02002	-095.92005 ± 8
L26	37.01999	-095.91965 ± 10
L27	37.02025	-095.91968 ± 13
L28	37.02026	-095.91995 ± 15
L29	37.02017	-095.91997 ± 4
L30	37.02045	-095.91954 ± 14

12/17/2014

[redacted]

	Sample	Pb	Other Significant Metals
	L29	134±8	
		142±8	
		149±8	
	L30	231±11	
		244±10	
		263±12	
	L31	128±7	
		129±7	
		137±7	
*	L32	694±17	Ex Situ 1100
		721±17	
		782±17	
*	L33	1545±33	Ex Situ 1105
		1535±33	
		1436±31	
*	L34	611±17	Ex Situ 1110
		634±17	
		654±17	
	L35	116±7	
		126±7	
		131±7	
	NIST 2781	212±9	
	L36	154±9	
		156±7	
		169±8	
	L37	118±7	
		111±7	
		122±7	
	L38	162±8	
		158±7	
		165±8	
	Blank	29	
	NIST 2711	1123±25	
	NIST 2781	227±9	

Collected sample marked # 1 TO
marked Ziploc bags for ex-situ
analysis with stainless steel trowels
Manually homogenized, removed visible gravel fraction
NO decon - had enough clean trowels

L31	37.02061	-095.91975	±10
L32	37.02072	-095.91976	±10
L33	37.02076	-095.91924	±7
L34	37.02067	-095.92021	±7
L35	37.02017	-095.92029	±11
L36	37.02032	-095.92009	±10
L37	37.02059	-095.92040	±7
L38	37.02055	-095.92065	±8

B61	1130	37.01849	-095.92006
B62	1140	37.01891	-095.91573	±19	±1
B63	1150	37.01877	-095.91123	±5

Ex Situ

XRF Analysis 01/16/2015 Instrument - Innov-X XT-490

R. Brown Analyst

Standardization OK Battery Paint, Ceramic Seal analysis

Sample	Pb
Nist 2781 L32	2001 10 Battery Paint

Ex 5:4J 01/29/2015

Innov-X DELTA Standardization OK Analysis Time 45s

Sample ID	Pb	Other significant metals
NIST 2781	97±7	
Blank	<LOD	
NIST 2711	1161±18	
* <LOD	901±14	
	850±13	
	808±14	
L12	1448±20	As 65±12
	823±14	
	1040±16	Cd 56±11
* L19	6111±75	As 204±31 Cd 65±15 Hg228±21
TCLP	5420±66	As 148±28 Hg 306±21 Cd 47±14
	6366±78	As 234±32 Hg 337±22 Cd 107±15
L32	1490±20	As 137±13 Hg 55±9
	1836±25	As 165±15 Hg 34±10
	1913±25	As 45±14 Hg 35±9
* L15	276±7	As 201 5 Cd 52±11
	286±6	As 38±6 Cd 57±11
	289±8	As 22±6 Cd 53±11
* L3	352±8	
	329±7	
	390±8	
RSD	378	
	390	
	389	
	337	
	365	
	375	
	365	
X L18	2045±26	As 136±15 Hg 90±12 Cd 41±12
	3758±46	As 75±22 Hg 131±16 Cd 61±13
TCLP	3784±44	As 131±22 Hg 50±15 Cd 55±13
L34	663±13	Hg 35±7
	571±9	As 67±7 Hg 30±6 Cd 33±9
	874±14	

01/22/2019

Sample ID	Pb	Other significant metals
X TCLP L33	3278±40	As 197±20 Hg 13±13 Cd 50±13
	3045±37	As 157±19 Cd 54±16
	2054±26	As 171±15
L24	546±6	As 49±10 Cd 46±14
	940±17	As 56±11 Hg 42±16 Cd 52±13
	625±12	As 33±8 Hg 47±8
L27	708±21	As 40±12 Hg 36±8
	355±21	As 59±11 Hg 40±8
	148±9	As 75±12 Hg 44±8
* L25	1900±24	As 76±14 Hg 92±13 Cd 44±11
	3790±46	As 169±22 Hg 121±17
TCLP	4560±58	As 86±24 Hg 189±18 Cd 61±13
* B6-2	82±4	
	91±3	
	90±5	
* B6-1	39±4	
	34±4	
	36±4	
* B6-3	21±3	
	15±3	
	24±3	
NIST 2781	186±6	
NIST 2711	1145±19	

* = Lab sample

Subsampled marked* samples in to Lab jars, delivered to CAS

11.5 Hazardous Substance Information

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

LEAD

CAS # 7439-92-1

Division of Toxicology and Environmental Medicine ToxFAQs™ **September 2005**

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,280 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.

What happens to lead when it enters the environment?

❑ Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.

❑ When lead is released to the air, it may travel long distances before settling to the ground.

❑ Once lead falls onto soil, it usually sticks to soil particles.

❑ Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

How might I be exposed to lead?

❑ Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.

❑ Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.

❑ Working in a job where lead is used or engaging in certain hobbies in which lead is used, such stained glass.

❑ Using health-care products or folk remedies that contain lead.

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services (DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on

Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

How can families reduce the risks of exposure to lead?

❏ Avoid exposure to sources of lead.

❏ Do not allow children to chew or mouth painted surfaces that may have been painted with lead-based paint.

❏ If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.

❏ Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children

❏ If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter (µg/dL). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3-6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC considers a lead level of 10 µg/dL to be a level of concern for children.

EPA limits lead in drinking water to 15 µg per liter.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for lead (Draft for Public Comment). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ARSENIC

CAS # 7440-38-2

Division of Toxicology and Environmental Medicine ToxFAQs™ **August 2007**

This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

What happens to arsenic when it enters the environment?

❑ Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching.
❑ Arsenic cannot be destroyed in the environment. It can only change its form.
❑ Rain and snow remove arsenic dust particles from the air.
❑ Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.
❑ Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that is much less harmful.

How might I be exposed to arsenic?

❑ Ingesting small amounts present in your food and water or breathing air containing arsenic.
❑ Breathing sawdust or burning smoke from wood treated with arsenic.
❑ Living in areas with unusually high natural levels of arsenic in rock.
❑ Working in a job that involves arsenic production or use, such as copper or lead smelting, wood treating, or pesticide application.

How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs.

Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies in animals show that some simple organic arsenic compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys

How likely is arsenic to cause cancer?

Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

How can arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults.

There is some evidence that inhaled or ingested arsenic can injure pregnant women or their unborn babies, although the studies are not definitive. Studies in animals show that large doses of arsenic that cause illness in pregnant females, can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal tissues. Arsenic is found at low levels in breast milk.

How can families reduce the risks of exposure to arsenic?

❑ If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective clothing to decrease exposure to sawdust.

❑ If you live in an area with high levels of arsenic in water or soil, you should use cleaner sources of water and limit contact with soil.

❑ If you work in a job that may expose you to arsenic, be aware that you may carry arsenic home on your clothing, skin, hair, or tools. Be sure to shower and change clothes before going home.

Is there a medical test to determine whether I've been exposed to arsenic?

There are tests available to measure arsenic in your blood, urine, hair, and fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict whether the arsenic levels in your body will affect your health.

Has the federal government made recommendations to protect human health?

The EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or cancelled many of the uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 10 micrograms of arsenic per cubic meter of workplace air (10 $\mu g/m^3$) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

CADMIUM

CAS # 7440-43-9

Division of Toxicology and Environmental Medicine ToxFAQs™ **September 2008**

This fact sheet answers the most frequently asked health questions (FAQs) about cadmium. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to cadmium happens mostly in the workplace where cadmium products are made. The general population is exposed from breathing cigarette smoke or eating cadmium contaminated foods. Cadmium damages the kidneys, lungs, and bones. Cadmium has been found in at least 1,014 of the 1,669 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is cadmium?

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide).

All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Most cadmium used in the United States is extracted during the production of other metals like zinc, lead, and copper. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings, and plastics.

What happens to cadmium when it enters the environment?

- ❏ Cadmium enters soil, water, and air from mining, industry, and burning coal and household wastes.
- ❏ Cadmium does not break down in the environment, but can change forms.
- ❏ Cadmium particles in air can travel long distances before falling to the ground or water.
- ❏ Some forms of cadmium dissolve in water.
- ❏ Cadmium binds strongly to soil particles.
- ❏ Fish, plants, and animals take up cadmium from the environment.

How might I be exposed to cadmium?

- ❏ Eating foods containing cadmium; low levels are found in all foods (highest levels are found in shellfish, liver, and kidney meats).
- ❏ Smoking cigarettes or breathing cigarette smoke.
- ❏ Breathing contaminated workplace air.
- ❏ Drinking contaminated water.
- ❏ Living near industrial facilities which release cadmium into the air.

How can cadmium affect my health?

Breathing high levels of cadmium can severely damage the lungs. Eating food or drinking water with very high levels severely irritates the stomach, leading to vomiting and diarrhea.

Long-term exposure to lower levels of cadmium in air, food, or water leads to a buildup of cadmium in the kidneys and possible kidney disease. Other long-term effects are lung damage and fragile bones.

How likely is cadmium to cause cancer?

The Department of Health and Human Services (DHHS) has determined that cadmium and cadmium compounds are known human carcinogens.

How can cadmium affect children?

The health effects in children are expected to be similar to the effects seen in adults (kidney, lung, and bone damage depending on the route of exposure).

A few studies in animals indicate that younger animals absorb more cadmium than adults. Animal studies also indicate that the young are more susceptible than adults to a loss of bone and decreased bone strength from exposure to cadmium.

We don't know if cadmium causes birth defects in people. The babies of animals exposed to high levels of cadmium during pregnancy had changes in behavior and learning ability. There is also some information from animal studies that high enough exposures to cadmium before birth can reduce body weights and affect the skeleton in the developing young.

How can families reduce the risks of exposure to cadmium?

❑ In the home, store substances that contain cadmium safely, and keep nickel-cadmium batteries out of reach of young children.
❑ Cadmium is a component of tobacco smoke. Avoid smoking in enclosed spaces like inside the home or car in order to limit exposure to children and other family members.
❑ If you work with cadmium, use all safety precautions to avoid carrying cadmium-containing dust home from work on your clothing, skin, hair, or tools.
❑ A balanced diet can reduce the amount of cadmium taken into the body from food and drink.

Is there a medical test to determine whether I've been exposed to cadmium?

Cadmium can be measured in blood, urine, hair, or nails. Urinary cadmium has been shown to accurately reflect the amount of cadmium in the body.

The amount of cadmium in your blood shows your recent exposure to cadmium. The amount of cadmium in your urine shows both your recent and your past exposure.

Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to cadmium in drinking water at concentrations of 0.04 ppm for up to 10 days is not expected to cause any adverse effects in a child.

The EPA has determined that lifetime exposure to 0.005 ppm cadmium is not expected to cause any adverse effects.

The FDA has determined that the cadmium concentration in bottled drinking water should not exceed 0.005 ppm.

The Occupational Health and Safety Administration (OSHA) has limited workers' exposure to an average of 5 $\mu g/m^3$ for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2008. Toxicological Profile for Cadmium (Draft for Public Comment). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

CHROMIUM

CAS # 7440-47-3

Division of Toxicology and Human Health Sciences ToxFAQs™ **October 2012**

This fact sheet answers the most frequently asked health questions (FAQs) about chromium. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to chromium occurs from ingesting contaminated food or drinking water or breathing contaminated workplace air. Chromium(VI) at high levels can damage the nose and cause cancer. Ingesting high levels of chromium(VI) may result in anemia or damage to the stomach or intestines. Chromium(III) is an essential nutrient. Chromium has been found in at least 1,127 of the 1,669 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is chromium?

Chromium is a naturally occurring element found in rocks, animals, plants, and soil. It can exist in several different forms. Depending on the form it takes, it can be a liquid, solid, or gas. The most common forms are chromium(0), chromium(III), and chromium(VI). No taste or odor is associated with chromium compounds.

The metal chromium, which is the chromium(0) form, is used for making steel. Chromium(VI) and chromium(III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.

What happens to chromium when it enters the environment?

- Chromium can be found in air, soil, and water after release from the manufacture, use, and disposal of chromium-based products, and during the manufacturing process.
- Chromium does not usually remain in the atmosphere, but is deposited into the soil and water.
- Chromium can easily change from one form to another in water and soil, depending on the conditions present.
- Fish do not accumulate much chromium in their bodies from water.

How might I be exposed to chromium?

- Eating food containing chromium(III).
- Breathing contaminated workplace air or skin contact during use in the workplace.
- Drinking contaminated well water.
- Living near uncontrolled hazardous waste sites containing chromium or industries that use chromium.

How can chromium affect my health?

Chromium(III) is an essential nutrient that helps the body use sugar, protein, and fat.

Breathing high levels of chromium(VI) can cause irritation to the lining of the nose, nose ulcers, runny nose, and breathing problems, such as asthma, cough, shortness of breath, or wheezing. The concentrations of chromium in air that can cause these effects may be different for different types of chromium compounds, with effects occurring at much lower concentrations for chromium(VI) compared to chromium(III).

The main health problems seen in animals following ingestion of chromium(VI) compounds are irritation and ulcers in the stomach and small intestine and anemia. Chromium(III) compounds are much less toxic and do not appear to cause these problems.

Sperm damage and damage to the male reproductive system have also been seen in laboratory animals exposed to chromium(VI).

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaqs/index.asp

Skin contact with certain chromium(VI) compounds can cause skin ulcers. Some people are extremely sensitive to chromium(VI) or chromium(III). Allergic reactions consisting of severe redness and swelling of the skin have been noted.

How likely is chromium to cause cancer?

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have determined that chromium(VI) compounds are known human carcinogens.

In workers, inhalation of chromium(VI) has been shown to cause lung cancer. Chromium(VI) also causes lung cancer in animals. An increase in stomach tumors was observed in humans and animals exposed to chromium(VI) in drinking water.

How can chromium affect children?

It is likely that health effects seen in children exposed to high amounts of chromium will be similar to the effects seen in adults.

We do not know if exposure to chromium will result in birth defects or other developmental effects in people. Some developmental effects have been observed in animals exposed to chromium(VI).

How can families reduce the risk of exposure to chromium?

- Children should avoid playing in soils near uncontrolled hazardous waste sites where chromium may have been discarded.
- Chromium is a component of tobacco smoke. Avoid smoking in enclosed spaces like inside the home or car in order to limit exposure to children and other family members.
- Although chromium(III) is an essential nutrient, you should avoid excessive use of dietary supplements containing chromium.

Is there a medical test to determine whether I've been exposed to chromium?

Since chromium(III) is an essential element and naturally occurs in food, there will always be some level of chromium in your body. Chromium can be measured in hair, urine, and blood.

Higher than normal levels of chromium in blood or urine may indicate that a person has been exposed to chromium. However, increases in blood and urine chromium levels cannot be used to predict the kind of health effects that might develop from that exposure.

Has the federal government made recommendations to protect human health?

The EPA has established a maximum contaminant level of 0.1 mg/L for total chromium in drinking water.

The FDA has determined that the chromium concentration in bottled drinking water should not exceed 0.1 mg/L.

The Occupational Health and Safety Administration (OSHA) has limited workers' exposure to an average of 0.005 mg/m^3 chromium(VI), 0.5 mg/m^3 chromium(III), and 1.0 mg/m^3 chromium(0) for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for Chromium. Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ZINC
CAS # 7440-66-6

Division of Toxicology ToxFAQs™ **August 2005**

This fact sheet answers the most frequently asked health questions (FAQs) about zinc. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Zinc is a naturally occurring element. Exposure to high levels of zinc occurs mostly from eating food, drinking water, or breathing workplace air that is contaminated. Low levels of zinc are essential for maintaining good health. Exposure to large amounts of zinc can be harmful. It can cause stomach cramps, anemia, and changes in cholesterol levels. Zinc has been found in at least 985 of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is zinc?

Zinc is one of the most common elements in the earth's crust. It is found in air, soil, and water, and is present in all foods. Pure zinc is a bluish-white shiny metal.

Zinc has many commercial uses as coatings to prevent rust, in dry cell batteries, and mixed with other metals to make alloys like brass, and bronze. A zinc and copper alloy is used to make pennies in the United States.

Zinc combines with other elements to form zinc compounds. Common zinc compounds found at hazardous waste sites include zinc chloride, zinc oxide, zinc sulfate, and zinc sulfide. Zinc compounds are widely used in industry to make paint, rubber, dyes, wood preservatives, and ointments.

What happens to zinc when it enters the environment?

❏ Some is released into the environment by natural processes, but most comes from human activities like mining, steel production, coal burning, and burning of waste.
❏ It attaches to soil, sediments, and dust particles in the air.
❏ Rain and snow remove zinc dust particles from the air.
❏ Depending on the type of soil, some zinc compounds can move into the groundwater and into lakes, streams, and rivers.
❏ Most of the zinc in soil stays bound to soil particles and does not dissolve in water.
❏ It builds up in fish and other organisms, but it does not build up in plants.

How might I be exposed to zinc?

❏ Ingesting small amounts present in your food and water.
❏ Drinking contaminated water or a beverage that has been stored in metal containers or flows through pipes that have been coated with zinc to resist rust.
❏ Eating too many dietary supplements that contain zinc.
❏ Working on any of the following jobs: construction, painting, automobile mechanics, mining, smelting, and welding; manufacture of brass, bronze, or other zinc-containing alloys; manufacture of galvanized metals; and manufacture of machine parts, rubber, paint, linoleum, oilcloths, batteries, some kind of glass, ceramics, and dyes.

How can zinc affect my health?

Zinc is an essential element in our diet. Too little zinc can cause problems, but too much zinc is also harmful.

Harmful effects generally begin at levels 10-15 times higher than the amount needed for good health. Large doses taken by mouth even for a short time can cause stomach cramps, nausea, and vomiting. Taken longer, it can cause anemia and decrease the levels of your good cholesterol. We do not know if high levels of zinc affect reproduction in humans. Rats that were fed large amounts of zinc became infertile.

Inhaling large amounts of zinc (as dusts or fumes) can cause a specific short-term disease called metal fume fever. We do not know the long-term effects of breathing high levels of zinc.

Putting low levels of zinc acetate and zinc chloride on the skin of rabbits, guinea pigs, and mice caused skin irritation. Skin irritation will probably occur in people.

How likely is zinc to cause cancer?

The Department of Health and Human Services (DHHS) and the International Agency for Research on Cancer (IARC) have not classified zinc for carcinogenicity. Based on incomplete information from human and animal studies, the EPA has determined that zinc is not classifiable as to its human carcinogenicity.

How can zinc affect children?

Zinc is essential for proper growth and development of young children. It is likely that children exposed to very high levels of zinc will have similar effects as adults. We do not know whether children are more susceptible to the effects of excessive intake of zinc than the adults.

We do not know if excess zinc can cause developmental effects in humans. Animal studies have found decreased weight in the offspring of animals that ingested very high amounts of zinc.

How can families reduce the risks of exposure to zinc?

❑ Children living near waste sites that contain zinc may be exposed to higher levels of zinc through breathing contaminated air, drinking contaminated drinking water, touching or eating contaminated soil.

❑ Discourage your children from eating soil or putting their hands in their mouths and teach them to wash their hands frequently and before eating.

❑ If you use medicines or vitamin supplements containing zinc, make sure you use them appropriately and keep them out of the reach of children.

Is there a medical test to determine whether I've been exposed to zinc?

There are tests available to measure zinc in your blood, urine, hair, saliva, and feces. These tests are not usually done in the doctor's office because they require special equipment. High levels of zinc in the feces can mean high recent zinc exposure. High levels of zinc in the blood can mean high zinc consumption and/or high exposure. Tests to measure zinc in hair may provide information on long-term zinc exposure; however, the relationship between levels in your hair and the amount of zinc you were exposed to is not clear.

Has the federal government made recommendations to protect human health?

The EPA recommends that drinking water should contain no more than 5 milligrams per liter of water (5 mg/L) because of taste. The EPA requires that any release of 1,000 pounds (or in some cases 5,000 pounds) into the environment be reported to the agency.

To protect workers, the Occupational Safety and Health Administration (OSHA) has set an average limit of 1 mg/m^3 for zinc chloride fumes and 5 mg/m^3 for zinc oxide (dusts and fumes) in workplace air during an 8-hour workday, 40-hour workweek.

Similarly, the National Institute for Occupational Safety and Health (NIOSH) has set the same standards for up to a 10-hour workday over a 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Zinc (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

11.6 2011 Site Evaluation

Curtis State Office Building
1000 SW Jackson, Suite 410
Topeka, Kansas 66612-1367

Kansas Department of Health and Environment

Site Evaluation

Caney Smelter Complaint Site

Caney, Kansas

Bureau of Environmental Remediation

SITE EVALUATION

Caney Smelter Complaint Site
Caney, Kansas

Prepared by:
Kansas Department of Health and Environment
Bureau of Environmental Remediation
Remedial Section
Site Assessment Program

June 2011

State ID: C3-063-72810

Project Manager:
Jon Vopata, Environmental Scientist

Field Team Members:
Jon Vopata, Environmental Scientist

TABLE OF CONTENTS

1.0 Introduction

This document presents the findings of a Pre-CERCLIS Site Evaluation (SE) assessment conducted by the Kansas Department of Health and Environment (KDHE) at the Caney Smelter Complaint site in Caney, Kansas. The assessment was conducted as part of continuing cooperative agreement with the U.S. Environmental Protection Agency (EPA) to perform investigations of selected sites to evaluate potential or actual releases of hazardous substances, pollutants, or contaminants in Kansas. These investigations are performed under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 CFR § 300.

2.0 Site Location and Description

The Caney Smelter Complaint site is located northeast of Caney in Montgomery County, Kansas. The property address is 811 North Cedar Street, Caney, Kansas 67333. The legal description is the east half of the northwest quarter of Section 7, Township 35 South, Range 14 East.

The subject property: encompasses approximately 3.5 acres; is heavily vegetated with trees, brush, grasses, and vines; includes foundations and structures from the former glass company and/or smelter operations; is littered with bricks and glass fragments; and contains used vehicles and other items left by the property owner. The surface elevation is approximately 790 feet above mean sea level. The surface topography is relatively flat. A residential property is located on the western portion of the site. Properties surrounding the site include primarily undeveloped fields and wooded areas.

3.0 Site Background

3.1 History

The Caney Smelter Complaint site was referred to the KDHE Site Assessment program in April 2010 after a resident of Caney informed KDHE of a potential area of smelter waste located on the northeastern edge of Caney. According to the informant, a smelter/brick facility that was also involved in glass glazing was located three-quarter miles east along the former railroad tracks north of the Caney High School.

Sanborn maps indicate the Cheyenne Window Glass Company operated at the subject property in 1912 and the Fredonia Window Glass Company operated at the subject property in 1917. It is likely that other glass, brick, and smelter operators owned the subject property at other times in the past.

The subject property is residential property currently owned by Larry Dee and Norma Jean Layton. According to Mr. Larry Layton, he purchased the subject property in approximately 1955. He recalled it was a former glass factory that had burnt down around 1920. A very large chimney was formerly located between sample locations SS-6 and SS-7 and other structures are still visible at the property. Mr. Layton indicated most of the structures and foundations on the property were from the glass factory with the exception of some smaller wooden structures later used to shelter pigs (Reference 2).

3.2 Previous Investigations

A review of KDHE site files identified the American Zinc, Lead and Smelting Company site located to the west, adjacent to the subject property. The American Zinc, Lead and Smelting Company operated from approximately 1901 to 1920.

KDHE completed a Preliminary Assessment of the American Zinc, Lead and Smelting Company site in December 1990 and a Screening Site Inspection in September 1991. In 1995, Blue Tee Corp. entered into an Administrative Order of Consent with the EPA for additional site characterization. In 1998, Blue Tee Corp. prepared and submitted a final Engineering Evaluation/Cost Analysis describing a recommended removal action alternative. Site removal activities were completed between June 1999 and April 2000. The site is currently in post-remedial monitoring (Reference 1).

A review of the American Zinc, Lead and Smelting Company site file indicates the American Zinc, Lead and Smelting Company may have owned the subject property at one time. There is no evidence that this property was ever investigated or sampled as part of the American Zinc, Lead and Smelting Company site. Investigation and remediation of the American Zinc, Lead and Smelting Company site was limited to properties west of 811 North Cedar Street (Reference 1).

4.0 Physical Setting

4.1 Land Use

The subject property use as a glass factory is well documented; however it is unknown if the property was also used for making bricks or smelting metals. According to Mr. Layton, the property has remained primarily untouched since the glass factory operated, with the exception of using the land to raise pigs and for storing a few old vehicles (Reference 2).

4.2 Soils and Geology

Soils at the site are classified as Bates-Collinsville complex (4 to 20 percent slopes), and Dennis silt loam (1 to 4 percent slopes). The Bates-Collinsville complex is comprised of the Bates series and the Collinsville series. The Bates Series consist of moderately deep, well drained, moderately permeable soils on uplands, formed in material weathered from thinly bedded sandstone and interbedded sandy and silty shale. The Collinsville series consist of shallow, well drained, moderately rapidly permeable upland soils, formed in material weathered from

sandstone. The Dennis series consist of deep, moderately well drained, slowly permeable soils on uplands, formed from material weathered from shale (Reference 6).

The surfical geology at the site consists of shale, siltstone, and fine-grained sandstone of the Stranger Formation. Depth of unconsolidated sediments to the shale, siltstone, or sandstone bedrock is unknown (Reference 3).

4.3 Hydrogeology

Limited, low yielding groundwater may be available within the unconsolidated sediment overlying the shale, siltstone, or sandstone bedrock, however the depth to groundwater, groundwater flow direction, and yield are unknown.

Very small to moderate yields of groundwater can be obtained from the Stanton Limestone Formation and the Chanute Shale Formation. Area wells range in depth from 40 feet to 200 feet below ground surface (Reference 1).

5.0 Targets

Two residential properties are located adjacent to the subject property. Larry Layton and his wife reside in the house immediately southwest of the subject property. The resident immediately west of the subject property is unknown, however during the SE the project manager noted evidence of children at the property.

A search of the Kansas Geological Survey water well completion records (Form WWC-5) identified: six domestic wells, 160 to 215 feet deep, constructed approximately 0.8 miles northwest of the subject property; ten Kerr McGee monitoring wells, 14 to 20 feet deep, constructed approximately 0.5 miles southwest of the subject property; and three Arco Pipeline monitoring wells, 7 to 40 feet deep, constructed approximately 0.9 miles east-northeast of the subject property. No other wells were identified within a 1-mile radius of the subject property (Reference 7).

There are 2.26 persons per household in Montgomery County, which equates to 13.56 potential drinking water targets associated with domestic wells (Reference 5). However, this estimate of the groundwater targets is limited by the WWC-5 water well record database, which only contains records of wells drilled since 1975.

The city of Caney and surrounding suburban developments obtain their drinking water from intakes on the Little Caney River located approximately two miles west-northwest, upgradient of the subject property (Reference 1). The population of Caney is approximately 1,894 persons.

6.0 Assessment Activities

6.1 Description of Field Activities

Jon Vopata of KDHE arrived at the site on May 10, 2011, to conduct SE field sampling activities. Mr. Vopata met with the property owner Larry Layton at his residence and spoke with Mr. Layton about the history of the property.

Following the conversation with Mr. Layton, Mr. Vopata commenced walking the site and identifying areas of potential metals contamination. Potential contaminated areas were flagged, analyzed with KDHE's Innov-x X-Ray Fluorescence (XRF) instrument, recorded with a global positioning system, and photographed. Of the 24 sample locations analyzed in situ, seven locations (SS-2, SS-6, SS-12, SS-18, SS-20, SS-21, and SS-23) were sampled for off-site metals analysis by Kansas Health and Environmental Laboratories (KHEL).

Following on-site sampling activities, Mr. Vopata collected background samples from the city park in Caney, Kansas. Background surface soil samples (BK-1, BK-2, and BK-3) were collected for metals analysis by KHEL.

All surface soil samples were collected using decontaminated stainless steel trowels. Samples were collected in plastic zip top bags, labeled, and stored in a cooler for transport to the laboratory. XRF analysis was conducted consistent with EPA Method 6200.

6.2 Sampling Plan Deviations

There were no notable deviations from the approved sampling plan.

6.3 Quality Assurance and Quality Control

Quality assurance was achieved by sampling in agreement with the appropriate standard operating procedures in accordance with KDHE's Generic Quality Assurance Project Plan and the Site Specific Quality Assurance Project Plan Addendum. Samples were collected as stated in the Field Sample Outline for the Caney Smelter Complaint site.

Quality control measures implemented in analyzing the soil samples with the XRF included: running the standardization clip for instrument calibration when the XRF was first started; analyzing sample BK-3 in repetition to test instrument precision; analyzing National Institute of Standards and Testing (NIST) Standard Reference Materials (SRM) 2702 and NIST SRM 2781 to test instrument accuracy; and comparative sample analysis to determine linear regressions and coefficient of correlations between laboratory results and XRF results.

The standardization clip was run during initialization of the instrument at startup. The standardization clip ran without failure or error indicating the XRF was properly standardized for sample analysis.

Sample BK-3 was analyzed eight times in replicate to determine the relative precision for target analytes. A relative standard deviation was calculated for each target analyte. The relative standard deviation for zinc was 4% and the relative standard deviation for lead was 8%; both are within the acceptable relative standard deviation of 20%. Relative standard deviations for arsenic and cadmium could not be calculated since these analytes were not detected by the XRF. Table 3 depicts the XRF precision test data for sample BK-3.

Calibration verification checks were performed to test the accuracy of the XRF by analyzing NIST SRMs 2702 and 2781. Comparing the XRF results to certified concentrations of the 2702 standard, percent differences between measured and certified values were calculated as follows: zinc 20%, lead 6.3%, and arsenic 5.1%; all within the acceptable range of 20%. Comparing the XRF results to the certified concentrations of the 2781 NIST standard, percent differences were calculated as follows: zinc 6.8%, lead 5.5%, and arsenic 194%. Lead and zinc were within the acceptable range of 20%, however the percent difference for arsenic was well outside this acceptable range. The calibration verification checks indicate the XRF is accurately reporting lead and zinc values. Table 4 depicts the XRF accuracy test data for the calibration verification check.

For comparative sample analysis linear regressions were calculated using the XRF vs. laboratory data for zinc, lead, cadmium, and arsenic. Coefficient of determination values were calculated as follows: zinc $r^2 = 0.99$, lead $r^2 = 0.99$, and cadmium $r^2 = 0.96$. Based on this comparative analysis zinc, lead, and cadmium XRF results can be considered at a minimum quantitative screening level data consistent with EPA Method 6200. Due to insufficient data a coefficient of determination could not be calculated for arsenic. Tables 5, 6, 7, and 8 depict the linear regressions and coefficient correlation for zinc, lead, cadmium, and arsenic.

Based on XRF quality control results, the arsenic results provided by the XRF cannot be considered quantitative. Therefore, only arsenic results provided by the off site laboratory will be included in the results and conclusion of this report.

7.0 Assessment Results

Lead was detected in surface soil samples at concentrations exceeding three times background and both residential and non-residential Tier 2 Risk levels. Lead exceeded the residential RSK level of 400 milligrams per kilogram (mg/kg) in samples SS-3 (623 mg/kg) and SS-18 (740 mg/kg). Lead exceeded the non-residential RSK level of 1,000 mg/kg in samples SS-2 (3,000 mg/kg), SS-12 (1,200 mg/kg), SS-20 (1,300 mg/kg), SS-21 (1,100 mg/kg), and SS-23 (2,500 mg/kg). No other samples exceeded three times background or RSK levels for lead.

Cadmium exceeded the three times background value and the residential Tier 2 RSK level of 39 mg/kg in soil sample SS-23 (56 mg/kg). No other soil samples exceeded RSK for cadmium.

Zinc exceeded the three times background value and the residential Tier 2 RSK level of 23,500 mg/kg in soil sample SS-23 (31,000 mg/kg). No other soil samples exceeded RSK for zinc.

Arsenic exceeded the residential Tier 2 RSK level of 11 mg/kg in soil samples SS-2 (19 mg/kg), SS-20 (16 mg/kg), SS-21 (17 mg/kg), and SS-23 (18 mg/kg); however, arsenic did not exceed the three times background value of 23 mg/kg in any sample analyzed.

Chromium exceeded the residential Tier 2 RSK level of 33.6 mg/kg in soil samples SS-18 (68 mg/kg), SS-20 (38 mg/kg), SS-21 (35 mg/kg), and SS-23 (34 mg/kg); however chromium did not exceed the three times background value of 70 mg/kg in any sample analyzed.

No other metals concentrations exceeded residential or non-residential Tier 2 RSK levels in any soil samples collected. Metals results are summarized in Table 1, Table 2, and Figure 3.

8.0 Conclusions

The Caney Smelter Complaint site was referred to the KDHE Site Assessment program after an individual informed KDHE that an area of smelter waste was present on property northeast of Caney. The American Zinc, Lead and Smelting Company site is located to the west, adjacent to the subject property. It is unknown if the American Zinc, Lead and Smelting Company and/or the Owens Zinc smelter formerly owned or used the subject property as part of their smelting operations.

Surface soil samples collected on May 10, 2011, identified metals impacts to soils on the subject property. Lead was detected in soil samples SS-2, SS-12, SS-20, SS-21, and SS-23 at concentrations exceeding non-residential Tier 2 RSK levels. Lead was detected above residential Tier 2 RSK levels at sample locations SS-3 and SS-18. Cadmium and zinc were detected above residential Tier 2 RSK levels at sample location SS-23. All arsenic, cadmium, and zinc Tier 2 RSK exceedences are associated with lead exceedences. No other samples exceeded RSK levels and three times background concentrations for metals. Metals results are summarized in Table 1, Table 2, and Figure 3.

Since a release of lead, cadmium, and zinc is present on one or more residential properties above KDHE Tier 2 RSK levels, an Integrated Assessment consistent with §300 of the NCP is recommended. A more detailed historical search of potential operators and relation of the site to known smelters in Caney are also recommended.

9.0 References

(1) Kansas Department of Health and Environment, Bureau of Environmental Remediation file Former American Zinc Lead and Smelting Company C3-063-00190.

(2) Larry Layton, May 10, 2011, onsite conversation with Jon Vopata, KDHE/BER.

(3) O'Connor, H.G., 1974, Geology and Groundwater Resources of Montgomery County, Southeastern Kansas: Kansas Geological Survey, Groundwater Series No.1.

(4) *Risk-Based Standards for Kansas*, RSK Manual – 5th Version, October 2010, Kansas Department of Health and Environment, Division of Environment, Bureau of Environmental Remediation.

(5) United States Census Bureau, 2000, *Montgomery County Quickfacts from the U.S. Census Bureau.* Accessed June 21, 2011 from http://quickfacts.census.gov/qfd/states/20/20125.html.

(6) United States Department of Agriculture Soil Conservation Service, in cooperation with Kansas Agricultural Experiment Station, 1980, *Soil Survey of Montgomery County, Kansas*.

(7) Water well completion records form WWC-5, available at: http://www.kgs.ku.edu/. Accessed June 21, 2011.

10.0 Appendices

Appendix 10.1

Tables and Figures

Table 1
Surface Soil - Off Site Laboratory Heavy Metals Results
Caney Smelter Complaint Site
Caney, Kansas

Soil Pathway, mg/Kg			Date:	5/10/2011	5/10/2011	5/10/2011	5/10/2011	5/10/2011	5/10/2011	5/10/2011	5/10/2011	5/10/2011	5/10/2011
			Sample ID:	SS-2	SS-6	SS-12	SS-18	SS-20	SS-21	SS-23	BK-1	BK-2	BK-3
Analyte:	**KDHE Tier 2 Residential RSK:**	**KDHE Tier 2 Non-Residential RSK:**	**3x Background**	**0-6 inches**	**0-6 inches**	**0-6 inches**	**0-6 inches**	**0-6 inches**	**0-6 inches**	**0-6 inches**	**0-6 inches**	**0-6 inches**	**0-6 inches**
Aluminum	Not Established	Not Established	45,000	18,000	5,000	19,000	22,000	25,000	17,000	17,000	17,000	17,000	11,000
Antimony	31	817	<15	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Arsenic	11	38	23	**19.0**	5.8	7.1	8.2	**16.0**	**17.0**	**18.0**	8.9	7.3	6.5
Barium	15,300	277,000	410	450	54	440	390	240	190	170	150	160	100
Beryllium	155	3,650	2	0.8	0.2	0.7	0.9	1.0	0.9	1.3	0.7	0.7	0.5
Boron	Not Established	Not Established	28	17.0	5.2	14.0	15.0	15.0	8.2	11.0	14.0	5.4	8.1
Cadmium	39	965	9	17.0	2.3	20.0	8.4	20.0	13.0	**56.0**	4.3	2.9	2.2
Calcium	Not Established	Not Established	17,000	16,000	10,000	17,000	13,000	9,500	4,200	7,300	7,400	3,600	6,000
Chromium (total)	33.6	111	70	32	10	29	**68**	**38**	**35**	**34**	27	24	19
Cobalt	23	579	12	8.0	4.0	5.9	7.5	8.4	9.4	12.0	3.9	4.4	3.5
Copper	3,130	81,700	112	160	14	57	49	220	190	560	59	28	25
Iron	Not Established	Not Established	39,000	29,000	11,000	21,000	21,000	30,000	40,000	30,000	13,000	14,000	12,000
Lead	400	1,000	359	**3,000**	110	**1,200**	**740**	**1,300**	**1,100**	**2,500**	140	120	99
Magnesium	Not Established	Not Established	4,400	2,300	680	2,300	2,700	2,500	1,600	1,600	1,800	1,400	1,200
Manganese	9,300	66,200	980	580	240	370	530	280	420	430	310	410	260
Molybdenum	Not Established	Not Established	<6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Nickel	1,540	32,400	35	20.0	6.4	17.0	28.0	29.0	31.0	41.0	12.0	12.0	11.0
Potassium	Not Established	Not Established	6,600	3,300	860	3,200	3,800	3,500	2,300	2,100	2,900	2,200	1,500
Selenium	391	10,200	<15	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Silica	Not Established	Not Established	11,200	3,600	2,900	3,900	3,200	3,600	3,900	3,600	3,400	3,800	4,000
Silver	391	10,200	<3	2.7	<1.0	<1.0	<1.0	1.8	1.7	3.2	<1.0	<1.0	<1.0
Sodium	Not Established	Not Established	283	230	78	140	240	190	170	170	92	51	140
Thallium	Not Established	Not Established	<15	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium	Not Established	Not Established	73	37	11	31	61	43	34	38	28	26	19
Zinc	23,500	613,000	2,040	8,000	650	3,600	1,800	7,600	5,700	**31,000**	730	720	590

Source: Division of Health and Environmental Laboratories Total Metals EPA Method 6010; complied by KDHE/BER

Comments: mg/Kg = milligrams per kilogram (total metal result)

RSK = Risk-based Standards for Kansas (Tier 2); Soil Pathway

BK = Background Samples

Bold value exceeds Residential RSK level.

Large Bold value exceeds Non-Residential RSK level.

Double Underline exceeds the average 3x background concentration

Table 2
Surface Soil - XRF and Laboratory Heavy Metals Results
Caney Smelter Complaint Site
Caney, Kansas

Analyte	Zinc			Lead			Arsenic			Cadmium		
Residential RSK	**23,500**			**400**			**11**			**39**		
Non-Residential RSK	**613,000**			**1,000**			**38**			**965**		
3x Background	2,040			359			23			9		
Sample ID	XRF	Avg. XRF	Lab	XRF	Avg. XRF	Lab	XRF	Avg. XRF	Lab	XRF	Avg. XRF	Lab
SS-1	357	342	---	99	105	---	<16	---	---	<26	---	---
	370			106			<16			<26		
	299			109			<17			<27		
SS-2	5,918	7,841	8,000	**2,175**	**2,729**	**3,000**	**108**	**105**	**19**	<26	---	17
	8,774			**2,948**			<75			<26		
	8,832			**3,065**			**101**			<26		
SS-3	3,294	3,472	---	**776**	**623**	---	<39	**43**	---	<25	26	---
	3,438			**542**			**35**			<27		
	3,685			**552**			**50**			26		
SS-4	1,522	1,550	---	178	195	---	<19	**21**	---	<25	---	---
	1,467			179			**21**			<25		
	1,661			229			<21			<25		
SS-5	777	758	---	104	102	---	<14	---	---	<24	---	---
	686			95			<13			<22		
	812			108			<13			<21		
SS-6	912	860	650	116	126	110	<14	---	6	<22	---	2
	872			118			<15			<22		
	797			143			<16			<24		
SS-7	1,460	1,203	---	145	108	---	**19**	**19**	---	<23	---	---
	1,205			111			<14			<21		
	944			69			<11			<21		
SS-8	518	504	---	64	69	---	<14	**21**	---	<26	---	---
	494			65			**21**			<26		
	501			77			<15			<27		
SS-9	537	574	---	293	282	---	<23	---	---	<25	---	---
	562			270			<22			<24		
	622			284			<22			<24		
SS-10	748	1,104	---	234	277	---	<21	---	---	<24	---	---
	1,193			303			<24			<24		
	1,372			293			<23			<25		
SS-11	1,890	1,331	---	147	142	---	<18	---	---	<25	---	---
	1,265			170			<19			<25		
	837			109			<15			<23		
SS-12	3,145	3,505	3,600	**834**	**1,088**	**1,200**	<40	---	7	<25	28	20
	3,616			**1,246**			<44			28		
	3,755			**1,185**			<45			28		
SS-13	2,856	2,980	---	330	323	---	<22	---	---	<21	---	---
	2,837			335			<23			<22		
	3,246			304			<23			<23		
SS-14	217	260	---	28	39	---	<8	---	---	<21	---	---
	255			48			<10			<23		
	308			41			<10			<23		
SS-15	154	173	---	45	38	---	<10	**11**	---	<23	---	---
	157			29			<9			<22		
	209			39			**11**			<23		
SS-16	464	477	---	125	129	---	<17	---	---	<24	---	---
	508			126			<17			<26		
	458			135			<18			<25		
SS-17	308	363	---	54	62	---	<12	---	---	<24	---	---
	397			51			<12			<24		
	384			82			<15			<25		
SS-18	1,321	1,728	1,800	**598**	**804**	**740**	<31	**41**	8	<23	---	8
	1,921			**893**			<37			<23		
	1,942			**920**			**41**			<23		
SS-19	2,309	2,884	---	229	295	---	<19	**38**	---	<21	32	---
	3,257			318			**38**			32		
	3,085			338			<24			<24		
SS-20	7,844	7,934	7,600	**1,399**	**1,276**	**1,300**	<48	---	**16**	**40**	36	20
	8,338			**1,211**			<45			<25		
	7,619			**1,219**			<44			32		
SS-21	6,679	6,620	5,700	**1,191**	**1,200**	**1,100**	<51	---	**17**	<29	---	13
	7,213			**1,333**			<53			<28		
	5,967			**1,075**			<46			<26		
SS-22	734	788	---	150	151	---	<17	---	---	<24	---	---
	850			149			<17			<24		
	780			153			<17			<24		
SS-23	**44,300**	**46,233**	**31,000**	**2,135**	**2,362**	**2,500**	<70	---	**18**	**65**	**68**	**56**
	47,300			**2,434**			<77			**71**		
	47,100			**2,518**			<79			**68**		
SS-24	1,111	1,011	---	215	203	---	<20	---	---	<23	---	---
	911			185			<19			<24		
	1,011			210			<20			<24		
BK-1	700	721	730	136	138	140	<15	---	9	<22	---	4
	719			125			<14			<21		
	744			153			<16			<22		
BK-2	752	789	720	143	147	120	<16	---	7	<23	---	3
	823			151			<16			<23		
	793			148			<17			<24		
BK-3	706	692	590	103	115	99	<14	---	7	<22	---	2
	644			118			<15			<23		
	726			125			<15			<23		

Source: Division of Health and Environmental Laboratories Total Metals EPA Method 6010; complied by KDHE/BER

Comments: Results provided in milligrams per kilogram (mg/kg)

XRF = X-Ray Floresence

RSK = Risk-based Standards for Kansas (Tier 2); Soil Pathway

BK = Background Samples

Bold value exceeds Residential RSK level.

Large Bold value exceeds Non-Residential RSK level.

Double Underline exceeds the average 3x background concentration

Table 3
XRF Precision Test
Caney Smelter Complaint Site
Caney, Kansas

Sample ID	Zinc	Lead	Arsenic	Cadmium
BK-3	668	115	<14	<23
BK-3	690	126	<15	<23
BK-3	616	103	<14	<22
BK-3	660	106	<14	<22
BK-3	678	112	<15	<23
BK-3	681	105	<14	<23
BK-3	640	119	<15	<23
BK-3	659	100	19	<23
Average	662	111	---	---
Standard Deviation	24	9	---	---
Relative Standard Deviation	4	8	---	---

Comments: Results provided in milligrams per kilograms
XRF = X-Ray Floresence
BK = Background Samples

Table 4
XRF Accuracy Test
Caney Smelter Complaint Site
Caney, Kansas

Sample ID	Analyte	Avg. XRF Result	Certified Concentration	Percent Difference
NIST Standard 2702	Zinc	387.5	485.3	20.2
	Lead	124.5	132.8	6.3
	Arsenic	43.0	45.3	5.1
	Cadmium	<30	0.8	---
NIST Standard 2781	Zinc	1186.0	1273.0	6.8
	Lead	191.0	202.1	5.5
	Arsenic	23.0	7.8	194.1
	Cadmium	<23	12.8	---

Comments: Results provided in milligrams per kilograms

XRF = X-Ray Floresence

NIST = National Institute of Standards & Technology

Table 5
Linear Regression and
Coefficient Correlation for Zinc
Caney Smelter Complaint Site
Caney, Kansas

Contaminant of Concern	Zinc	
Sample ID	**XRF**	**Laboratory**
SS-2	7,841	8,000
SS-6	860	650
SS-12	3,505	3,600
SS-18	1,728	1,800
SS-20	7,934	7,600
SS-21	6,620	5,700
SS-23	46,233	31,000
BK-1	721	730
BK-2	789	720
BK-3	692	590

Comments: Result in milligrams per kilogram

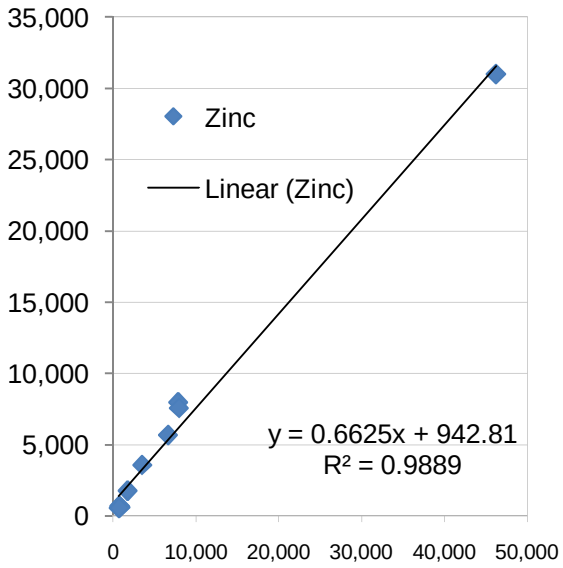


Table 6
Linear Regression and
Coefficient Correlation for Lead
Caney Smelter Complaint Site
Caney, Kansas

Contaminant of Concern	Lead	
Sample ID	**XRF**	**Laboratory**
SS-2	2,729	3,000
SS-6	126	110
SS-12	1,088	1,200
SS-18	804	740
SS-20	1,276	1,300
SS-21	1,200	1,100
SS-23	2,362	2,500
BK-1	138	140
BK-2	147	120
BK-3	115	99

Comments: Result in milligrams per kilogram

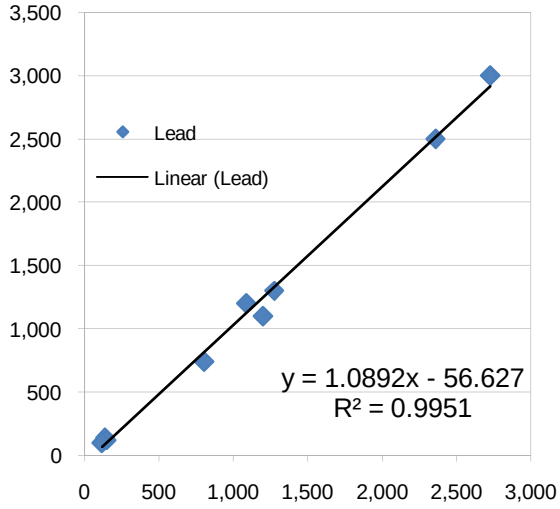


Table 7
Linear Regression and
Coefficient Correlation for Cadmium
Caney Smelter Complaint Site
Caney, Kansas

Contaminant of Concern	Cadmium	
Sample ID	XRF	Laboratory
SS-12	28	20
SS-20	36	20
SS-23	68	56

Comments: Result in milligrams per kilogram

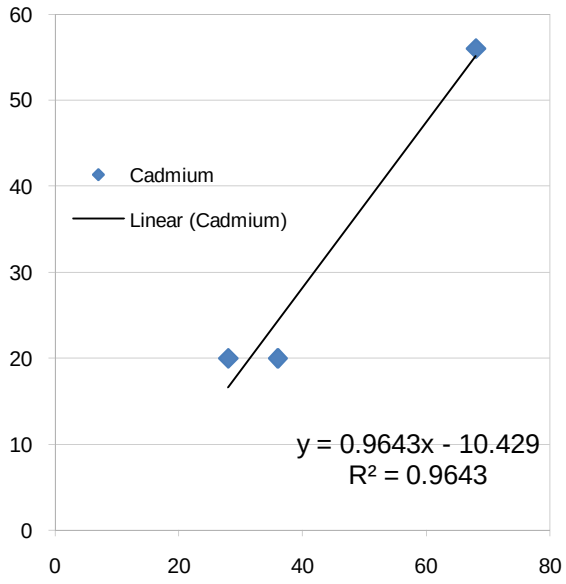
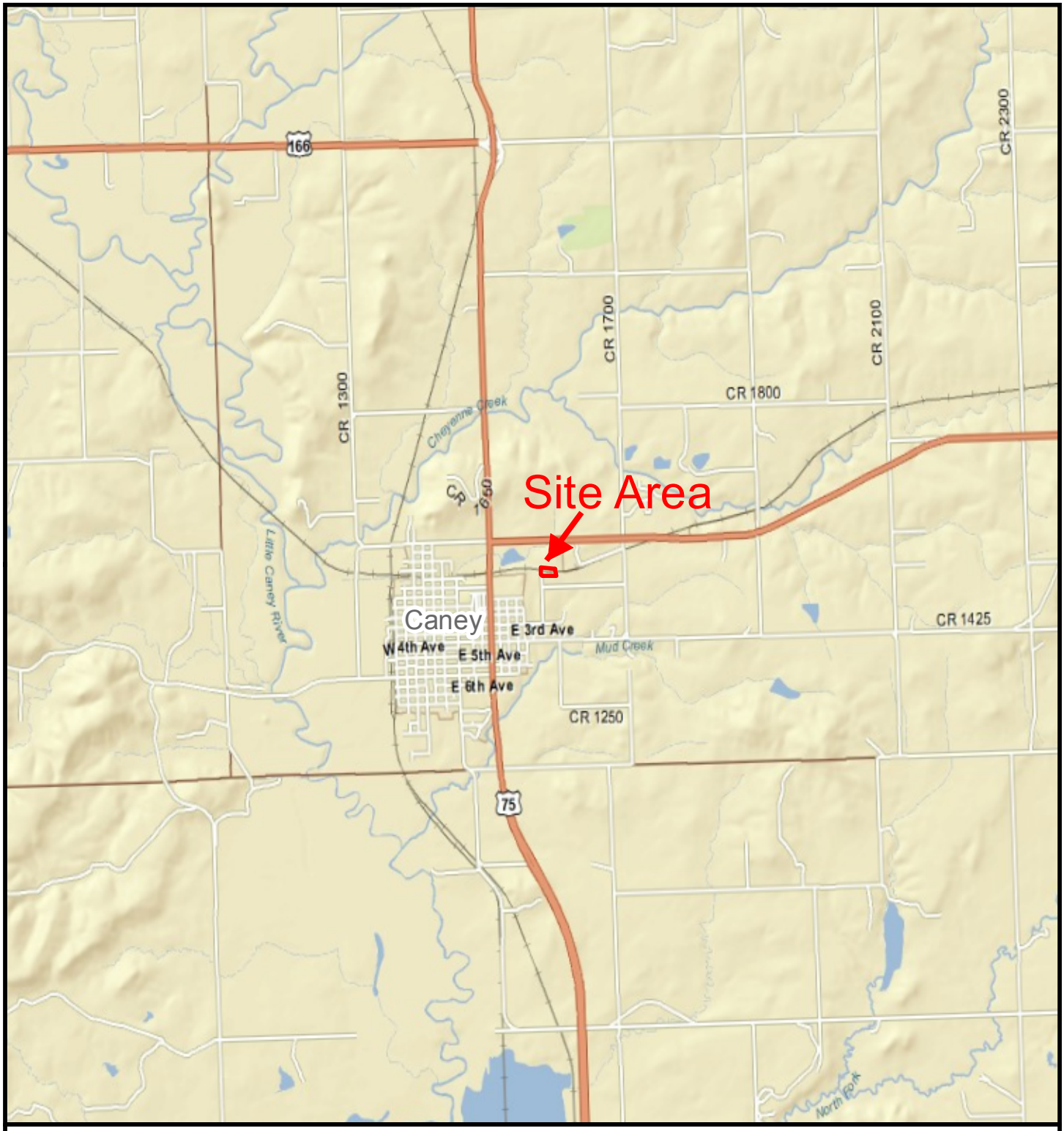


Table 8
Linear Regression and
Coefficient Correlation for Arsenic
Caney Smelter Complaint Site
Caney, Kansas

Contaminant of Concern	Arsenic	
Sample ID	**XRF**	**Laboratory**
SS-2	105	19
SS-18	41	8

Comments: Result in milligrams per kilogram

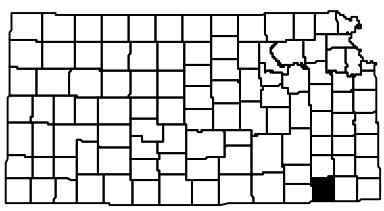
***Insufficient Data to Calculate Linear Regression and Coefficient of Correlation**



0 0.5 1 2 Miles

N

Montgomery County



Kansas Department of Health and Environment

FIGURE 1

Area Map
Caney Smelter Complaint Site
Caney, Kansas

Project Manager: JV Drawn by: JV

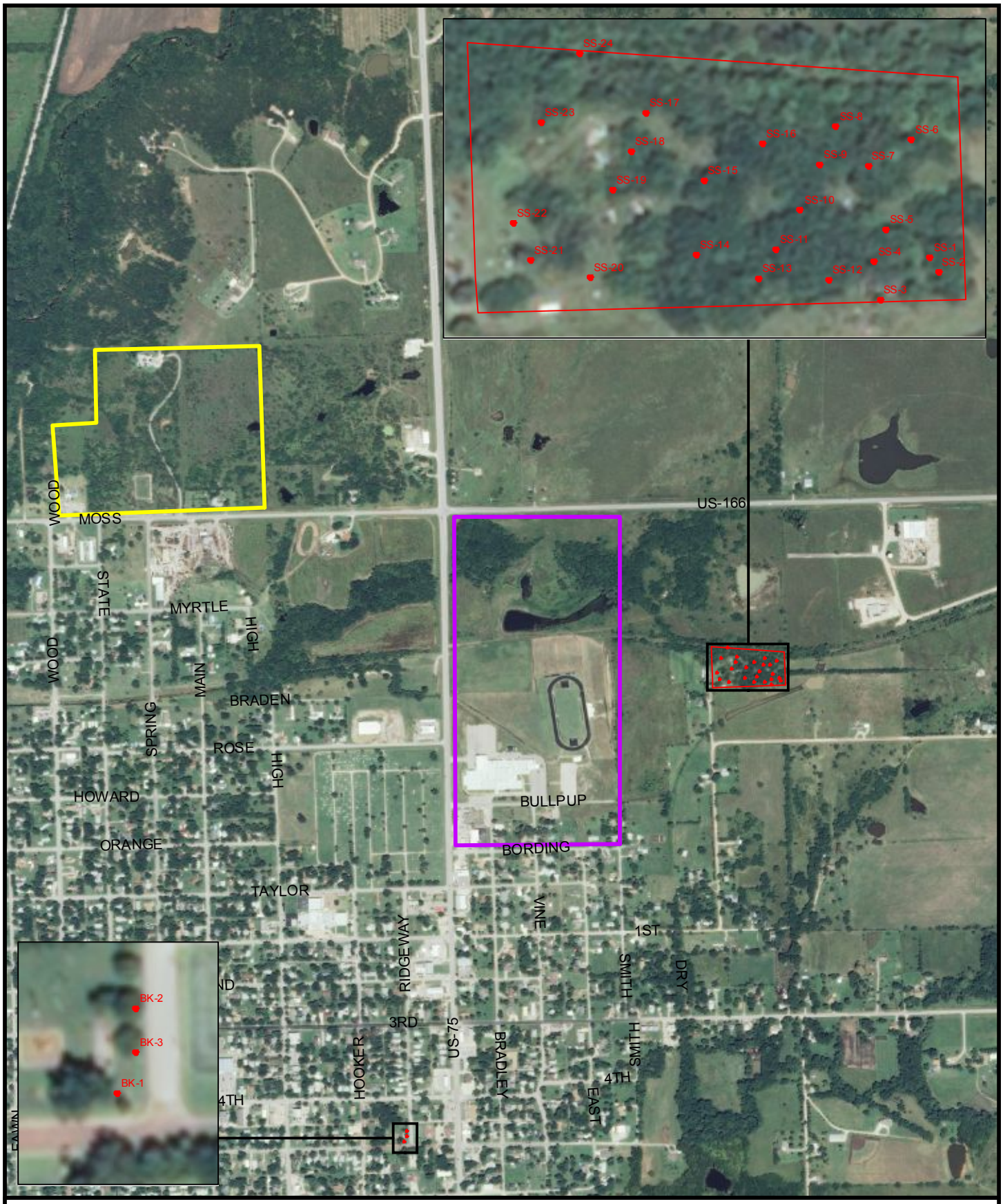


FIGURE 2

Surface Soil Sample Locations
Caney Smelter Complaint Site
Caney, Kansas

0 20 40 80 120 Feet

● SS-1 Surface Soil Sample Location

Subject Property

Lead 450

Cadmium 61

Zinc 41,000

Contaminants Exceeding KDHE Tier 2 RSK Levels and Three Times Background Concentrations.
Results in milligrams per kilogram.
Smaller Text labels exceed Residential RSK levels.
Larger Text labels exceed Non-Residential RSK levels.
* - Denotes average XRF sample result.

N

FIGURE 3

Metals Results Exceeding KDHE RSK and Three Times Background Concentrations
Caney Smelter Complaint Site
Caney, Kansas

Appendix 10.2

Photographic Documentation

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: E-SE

Caption:

Sample Location SS-1.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NE

Caption:

Sample Location SS-2.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NE

Caption:

Sample Location SS-3.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NW

Caption:

Sample Location SS-4.

Photo Date: 5/11/2011

Photographer: J. Vopata

Viewing Direction: S

Caption:

Sample Location SS-5.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: SW

Caption:

Sample Location SS-6.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NE

Caption:

Sample Location SS-7.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NW

Caption:

Sample Location SS-8.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NE

Caption:

Sample Location SS-9.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: SE

Caption:

Sample Location SS-10.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: W

Caption:

Sample Location SS-11.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-12.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-13.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-14.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-15.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-16.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-17.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-18.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NW

Caption:

Sample Location SS-19.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: E

Caption:

Sample Location SS-20.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: N

Caption:

Sample Location SS-21.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: W

Caption:

Sample Location SS-22.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: E

Caption:

Sample Location SS-23.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: S

Caption:

Sample Location SS-24.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NW

Caption:

Sample Location BK-1.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NW

Caption:

Sample Location BK-2.

Photo Date: 5/10/2011

Photographer: J. Vopata

Viewing Direction: NW

Caption:

Sample Location BK-3.

Appendix 10.3

Analytical Data

KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES
Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561856

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT SS-2
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 18:00 Date/Time Received: 05/19/11 16:30

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	18000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	19	mg/Kg	06/01/11	EPA 6010
Barium (Total)	450	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.75	mg/Kg	06/01/11	EPA 6010
Boron (Total)	17	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	17	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	16000	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	32	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	8.0	mg/Kg	06/01/11	EPA 6010
Copper (Total)	160	mg/Kg	06/01/11	EPA 6010
Iron (Total)	29000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	3000	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	2300	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	580	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	20	mg/Kg	06/01/11	EPA 6010
Percent Solids	95	Percent	05/24/11	EPA 1311
Potassium (Total)	3300	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3600	mg/Kg	06/01/11	EPA 6010
Silver (Total)	2.7	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	230	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	37	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	8000	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

< - Not Detected at Indicated Level
* - Holding Time Exceeded

Laboratory Customer Service - (785) 296-1620
Laboratory Fax - (785) 296-1641
CLIA No. 17D0648254

KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES
Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561861

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT SS-6
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 18:14 Date/Time Received: 05/19/11 16:33

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	5000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	5.8	mg/Kg	06/01/11	EPA 6010
Barium (Total)	54	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.21	mg/Kg	06/01/11	EPA 6010
Boron (Total)	5.2	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	2.3	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	10000	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	10	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	4.0	mg/Kg	06/01/11	EPA 6010
Copper (Total)	14	mg/Kg	06/01/11	EPA 6010
Iron (Total)	11000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	110	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	680	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	240	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	6.4	mg/Kg	06/01/11	EPA 6010
Percent Solids	95	Percent	05/24/11	EPA 1311
Potassium (Total)	860	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	2900	mg/Kg	06/01/11	EPA 6010
Silver (Total)	< 1.0	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	78	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	11	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	650	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

< - Not Detected at Indicated Level
* - Holding Time Exceeded

Laboratory Customer Service - (785) 296-1620
Laboratory Fax - (785) 296-1641
CLIA No. 17D0648254

KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES
Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561864

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT SS-12
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 18:23 Date/Time Received: 05/19/11 16:34

Sample Comments:

Parameter	*Analytical Result*	*Units*	*Analysis Date*	*Analytical Method*
Aluminum (Total)	19000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	7.1	mg/Kg	06/01/11	EPA 6010
Barium (Total)	440	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.69	mg/Kg	06/01/11	EPA 6010
Boron (Total)	14	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	20	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	17000	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	29	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	5.9	mg/Kg	06/01/11	EPA 6010
Copper (Total)	57	mg/Kg	06/01/11	EPA 6010
Iron (Total)	21000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	1200	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	2300	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	370	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	17	mg/Kg	06/01/11	EPA 6010
Percent Solids	91	Percent	05/24/11	EPA 1311
Potassium (Total)	3200	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3900	mg/Kg	06/01/11	EPA 6010
Silver (Total)	< 1.0	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	140	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	31	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	3600	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

< - Not Detected at Indicated Level
* - Holding Time Exceeded

Laboratory Customer Service - (785) 296-1620
Laboratory Fax - (785) 296-1641
CLIA No. 17D0648254

KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES
Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561863

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT SS-18
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 18:35 Date/Time Received: 05/19/11 16:33

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	22000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	8.2	mg/Kg	06/01/11	EPA 6010
Barium (Total)	390	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.87	mg/Kg	06/01/11	EPA 6010
Boron (Total)	15	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	8.4	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	13000	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	68	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	7.5	mg/Kg	06/01/11	EPA 6010
Copper (Total)	49	mg/Kg	06/01/11	EPA 6010
Iron (Total)	21000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	740	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	2700	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	530	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	28	mg/Kg	06/01/11	EPA 6010
Percent Solids	92	Percent	05/24/11	EPA 1311
Potassium (Total)	3800	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3200	mg/Kg	06/01/11	EPA 6010
Silver (Total)	< 1.0	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	240	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	61	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	1800	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

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* - Holding Time Exceeded

Laboratory Customer Service - (785) 296-1620
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KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES
Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561860

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT SS-20
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 18:41 Date/Time Received: 05/19/11 16:32

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	25000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	16	mg/Kg	06/01/11	EPA 6010
Barium (Total)	240	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	1.0	mg/Kg	06/01/11	EPA 6010
Boron (Total)	15	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	20	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	9500	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	38	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	8.4	mg/Kg	06/01/11	EPA 6010
Copper (Total)	220	mg/Kg	06/01/11	EPA 6010
Iron (Total)	30000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	1300	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	2500	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	280	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	29	mg/Kg	06/01/11	EPA 6010
Percent Solids	83	Percent	05/24/11	EPA 1311
Potassium (Total)	3500	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3600	mg/Kg	06/01/11	EPA 6010
Silver (Total)	1.8	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	190	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	43	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	7600	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

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* - Holding Time Exceeded

Laboratory Customer Service - (785) 296-1620
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KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES

Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561862

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT SS-21
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 18:43 Date/Time Received: 05/19/11 16:33

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	17000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	17	mg/Kg	06/01/11	EPA 6010
Barium (Total)	190	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.90	mg/Kg	06/01/11	EPA 6010
Boron (Total)	8.2	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	13	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	4200	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	35	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	9.4	mg/Kg	06/01/11	EPA 6010
Copper (Total)	190	mg/Kg	06/01/11	EPA 6010
Iron (Total)	40000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	1100	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	1600	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	420	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	31	mg/Kg	06/01/11	EPA 6010
Percent Solids	99	Percent	05/24/11	EPA 1311
Potassium (Total)	2300	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3900	mg/Kg	06/01/11	EPA 6010
Silver (Total)	1.7	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	170	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	34	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	5700	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

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KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES
Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561855

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT SS-23
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 18:50 Date/Time Received: 05/19/11 16:29

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	17000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	18	mg/Kg	06/01/11	EPA 6010
Barium (Total)	170	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	1.3	mg/Kg	06/01/11	EPA 6010
Boron (Total)	11	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	56	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	7300	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	34	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	12	mg/Kg	06/01/11	EPA 6010
Copper (Total)	560	mg/Kg	06/01/11	EPA 6010
Iron (Total)	30000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	2500	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	1600	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	430	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	41	mg/Kg	06/01/11	EPA 6010
Percent Solids	88	Percent	05/24/11	EPA 1311
Potassium (Total)	2100	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3600	mg/Kg	06/01/11	EPA 6010
Silver (Total)	3.2	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	170	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	38	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	31000	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

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* - Holding Time Exceeded

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CLIA No. 17D0648254

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Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561859

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT BK-1
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 19:30 Date/Time Received: 05/19/11 16:32

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	17000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	8.9	mg/Kg	06/01/11	EPA 6010
Barium (Total)	150	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.66	mg/Kg	06/01/11	EPA 6010
Boron (Total)	14	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	4.3	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	7400	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	27	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	3.9	mg/Kg	06/01/11	EPA 6010
Copper (Total)	59	mg/Kg	06/01/11	EPA 6010
Iron (Total)	13000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	140	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	1800	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	310	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	12	mg/Kg	06/01/11	EPA 6010
Percent Solids	84	Percent	05/24/11	EPA 1311
Potassium (Total)	2900	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3400	mg/Kg	06/01/11	EPA 6010
Silver (Total)	< 1.0	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	92	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	28	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	730	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
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Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561857

4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT BK-2
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 19:39 Date/Time Received: 05/19/11 16:30

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	17000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	7.3	mg/Kg	06/01/11	EPA 6010
Barium (Total)	160	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.70	mg/Kg	06/01/11	EPA 6010
Boron (Total)	5.4	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	2.9	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	3600	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	24	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	4.4	mg/Kg	06/01/11	EPA 6010
Copper (Total)	28	mg/Kg	06/01/11	EPA 6010
Iron (Total)	14000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	120	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	1400	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	410	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	12	mg/Kg	06/01/11	EPA 6010
Percent Solids	95	Percent	05/24/11	EPA 1311
Potassium (Total)	2200	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	3800	mg/Kg	06/01/11	EPA 6010
Silver (Total)	< 1.0	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	51	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	26	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	720	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

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* - Holding Time Exceeded

KANSAS HEALTH AND ENVIRONMENTAL LABORATORIES
Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001

REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: BUREAU OF ENV. REMEDIATION
ATTN JON VOPATA
CURTIS SOB, SUITE 410
TOPEKA KS 66612

Analysis Code: PT Lab Number: 561858
4EM80
Site ID:
Account Code: EP

Collection Location: C3-063-72810 CANEY SMELTER COMPLAINT BK-3
Collector: VOPATA Matrix: Soil Collect Depth:
Date/Time Collected: 05/10/11 19:46 Date/Time Received: 05/19/11 16:31

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	11000	mg/Kg	06/01/11	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Arsenic (Total)	6.5	mg/Kg	06/01/11	EPA 6010
Barium (Total)	100	mg/Kg	06/01/11	EPA 6010
Beryllium (Total)	0.53	mg/Kg	06/01/11	EPA 6010
Boron (Total)	8.1	mg/Kg	06/01/11	EPA 6010
Cadmium (Total)	2.2	mg/Kg	06/01/11	EPA 6010
Calcium (Total)	6000	mg/Kg	06/01/11	EPA 6010
Chromium (Total)	19	mg/Kg	06/01/11	EPA 6010
Cobalt (Total)	3.5	mg/Kg	06/01/11	EPA 6010
Copper (Total)	25	mg/Kg	06/01/11	EPA 6010
Iron (Total)	12000	mg/Kg	06/01/11	EPA 6010
Lead (Total)	99	mg/Kg	06/01/11	EPA 6010
Magnesium (Total)	1200	mg/Kg	06/01/11	EPA 6010
Manganese (Total)	260	mg/Kg	06/01/11	EPA 6010
Molybdenum (Total)	< 2.0	mg/Kg	06/01/11	EPA 6010
Nickel (Total)	11	mg/Kg	06/01/11	EPA 6010
Percent Solids	91	Percent	05/24/11	EPA 1311
Potassium (Total)	1500	mg/Kg	06/01/11	EPA 6010
Selenium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Silica (Total)	4000	mg/Kg	06/01/11	EPA 6010
Silver (Total)	< 1.0	mg/Kg	06/01/11	EPA 6010
Sodium (Total)	140	mg/Kg	06/01/11	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	06/01/11	EPA 6010
Vanadium (Total)	19	mg/Kg	06/01/11	EPA 6010
Zinc (Total)	590	mg/Kg	06/01/11	EPA 6010

Analytical Comments:
Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 06/02/11
Copies To: File

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Laboratory Customer Service - (785) 296-1620
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CLIA No. 17D0648254

Appendix 10.4

Field Notes

Caney Smelter Complaint

5/10/11 SE JV

10:00 - Powered on XRF in basement lab room of Curtis Building. Ran XRF calibration check. Calibration check verified. ok.
11:40 - Departed Curtis building in vehicle #11465.
14:45 - Arrived in Caney, KS
Clear, Sunny, South Breeze, ~90°F
14:55 - Analyzed Nist Standard 2731
Pb = 198
Zn = 1219

Analyzed Nist Standard
Pb = 123
Zn = 449

~~15:00 - Collected background soil sample BK-1~~ JV
15:10 - Arrived on site & met Larry Layton at his house. Larry walked the property and pointed out foundations from the glass factory and where things were. He purchased the property when he was 15 he is now 71 years old. The factory burnt down in 1920.

15:40 - Began XRFing locations on site.
37.02 95.91

Location	Lat.	Long.	Pb	As	Zn	Cd
1	014	963	99	<16	357	<26
" "	" "	" "	106	<16	370	<26
" "	" "	" "	104	<17	299	<27
2	009	960	2175	103	5918	<26
" "	" "	" "	2948	<75	8774	<26
" "	" "	" "	3065	101	8832	<26
3	001	983	776	<39	3294	<25
" "	" "	" "	542	35	3438	<27
" "	" "	" "	552	50	3685	26
4	013	985	178	<19	1523	<25
" "	" "	" "	179	21	1467	<25
" "	" "	" "	229	<21	1661	<25

5/10/11 JV

5/10/11

Carney SE

JV

37.02 95.98

Location	Lat.	Long	Zn	Pb	As	Cd
5	023	1180	777	104	<14	<24
〃 〃	〃 〃	〃 〃	686	95	<13	<22
〃 〃	〃 〃	〃 〃	812	108	<13	<21
6	051	1969	912	116	<14	<22
〃 〃	〃 〃	〃 〃	872	118	<15	<22
〃 〃	〃 〃	〃 〃	797	143	<16	<24
7	043	1986	1460	145	19	<23
〃 〃	〃 〃	〃 〃	1205	111	<14	<21
〃 〃	〃 〃	〃 〃	944	69	<11	<21
8	056	1998	518	64	<14	<26
〃 〃	〃 〃	〃 〃	494	65	21	<26
〃 〃	〃 〃	〃 〃	501	77	<15	<27
9	044	2005	537	293	<23	<25
〃 〃	〃 〃	〃 〃	562	270	<22	<24
〃 〃	〃 〃	〃 〃	622	284	<22	<24
10	030	2013	748	234	<21	<24
〃 〃	〃 〃	〃 〃	1193	303	<24	<24
〃 〃	〃 〃	〃 〃	1372	293	<23	<25
11	018	2023	1890	147	<18	<25
〃 〃	〃 〃	〃 〃	1265	170	<19	<25
〃 〃	〃 〃	〃 〃	837	109	<15	<23
12	008	2005	3145	834	<40	<25
〃 〃	〃 〃	〃 〃	3616	1246	<44	28
〃 〃	〃 〃	〃 〃	3755	1185	<45	28
13	009	2030	2856	330	<22	<21
〃 〃	〃 〃	〃 〃	2837	335	<23	<22
〃 〃	〃 〃	〃 〃	3246	304	<23	<23
14	017	2054	217	28	<8	<21
〃 〃	〃 〃	〃 〃	255	48	<10	<23
〃 〃	〃 〃	〃 〃	308	41	<10	<23
15	040	2050	154	45	<10	<23
〃 〃	〃 〃	〃 〃	157	29	<9	<22
〃 〃	〃 〃	〃 〃	209	39	11	<23
16	051	2027	464	135	<17	<24
〃 〃	〃 〃	〃 〃	508	126	<17	<26
〃 〃	〃 〃	〃 〃	458	135	<18	<25

JV

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37.02 95.9

Location	Lat.	Long.	Zn	Pb	As	Cd
17	062	2072	308	54	<12	<24
" "	" "	" "	397	51	<12	<24
" "	" "	" "	384	82	<15	<25
Nist	Standard	2781	1153	184	23	<23
Nist	Standard	2702	326	126	43	<30
18	050	2078	1321	598	<31	<23
" "	" "	" "	1921	893	<37	<23
" "	" "	" "	1942	920	41	<23
19	038	2086	2309	229	<19	<21
" "	" "	" "	3257	318	38	32
" "	" "	" "	3085	338	<24	<24
20	011	2096	7844	1399	<48	40
" "	" "	" "	8338	1211	<45	<25
" "	" "	" "	7619	1219	<44	32
21	017	2119	6679	1191	<51	<29
" "	" "	" "	7213	1333	<53	<28
" "	" "	" "	5967	1075	<46	<26
22	029	2125	734	150	<17	<24
" "	" "	" "	850	149	<17	<24
" "	" "	" "	780	153	<17	<24
23	060	2113	4.43%	2135	<70	65
" "	" "	" "	4.73%	2434	<77	71
" "	" "	" "	4.71%	2518	<79	68
24	081	2097	1111	215	<20	<23
" "	" "	" "	911	185	<19	<24
" "	" "	" "	1011	210	<20	<24

17:58 - Photographed location SS-1

18:00 - Collected surface soil sample and photographed sample location "SS-2".

18:10 - Photographed locations SS-3, 4, +5.

18:14 - Collected surface soil sample and photographed location "SS-6."

18:20 - Photographed locations SS-7, SS-8, SS-9, SS-10, + SS-11.

18:23 - Collected surface soil sample and photographed location "SS-12"

18:30 - Photographed locations SS-13, SS-14, SS-15, SS-16, + SS-17.

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Caney SE

JV

18:35 - Collected surface soil sample and photographed location SS-18.
18:39 - Photographed location SS-19.
18:41 - Collected surface soil sample and photographed location SS-20.
18:43 - Collected surface soil sample and photographed location SS-21.
18:49 - Photographed location SS-22.
18:50 - Collected surface soil sample and photographed location SS-23.
18:55 - Photographed location SS-24.
19:00 - Picked up supplies and departed subject site.
19:10 - Arrived at city park in Caney, KS.
Selected 3 surface soil background sample locations.
Began XRFing background surface soil locations.

Location	Latitude	Longitude	Zn	Pb	As	Cd
BK-1	37.01064	95.92987	700	136	<15	<22
" "	" "	" "	719	125	<14	<21
" "	" "	" "	744	153	<16	<22
BK-2	37.01086	95.92980	752	143	<16	<23
" "	" "	" "	823	151	<16	<23
" "	" "	" "	793	148	<17	<24
BK-3	37.01074	95.92984	706	103	<14	<22
" "	" "	" "	644	118	<15	<23
" "	" "	" "	726	125	<15	<23

19:30 - Collected surface soil sample and photographed location BK-1.
19:39 - Collected surface soil sample and photographed location BK-2.
19:46 - Collected surface soil sample and photographed location BK-3.
19:55 - Picked up supplies, packed up the XRF and departed Caney for Topeka, KS.

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13:00 – Analyzed soil sample BK-3 multiple times to test XRF precision.

Run #	Zn	Pb	As	Cd
1	668	115	<14	<23
2	690	126	<15	<23
3	616	103	<14	<22
4	660	106	<14	<22
5	678	112	<15	<23
6	681	105	<14	<23
7	640	119	<15	<23
8	659	100	19	<23

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Appendix 10.5

Site Evaluation Form

Kansas Department of Health and Environment

Pre-CERCLIS Site Evaluation Form

I. Site Information

Site Name: Caney Smelter Complaint Site			
Address or location: 811 N Cedar Street			
City: Caney	County: Montgomery	State: Kansas	ZIP: 67333
Telephone:	Fax:		
Directions to Site: In Caney, Kansas take First Street east out of town, turn left (north) onto Cedar Street. Continue north on Cedar Street until it dead ends at the site.			
Map attached? ☒ (In SE Report)			
Requested by: Rick Bean	Agency/Office: KDHE/BER		
Address: 1000 SW Jackson Suite 410		Date of Request: 7/1/2010	
City: Topeka	State: Kansas	ZIP: 66612	
Phone: 785-296-1675	E-mail: rbean@kdheks.gov	Fax: 785-296-7030	
Site Contact: Jon Vopata			
Address: 1000 SW Jackson Suite 410			
City: Topeka	State: Kansas	ZIP: 66612	
Phone: 785-296-8063	E-mail: jvopata@kdheks.gov	Fax: 785-296-7030	

III. CERCLA Site Screening Response Criteria (see Section V for definitions)

A. Is there a release or threat of release as defined by the NCP? Yes ☒ No ☐
Explain: Lead, cadmium, and zinc were detected in surface soil samples above RSK.

B. Is the source a facility or vessel as defined by the NCP? Yes ☒ No ☐
Explain: The source is an area of former buildings and structures.

C. Does the release or threat of release involve a hazardous substance, pollutant, or contaminant as defined by the NCP? Yes ☒ No ☐
Explain: Lead, cadmium, and zinc are hazardous substances, pollutants, or contaminants.

D. Is the release subject to the limitations on response? Yes ☐ No ☒
Explain:

E. Does the quantity or concentration warrant response? Yes ☒ No ☐
Explain: Lead, cadmium, and zinc were detected in surface soil samples above RSK.

F. Has a PRP been identified? Yes ☐ No ☒

Name:		Telephone:	
Address:	City:	State:	Zip:

G. Document operational and regulatory history: see attached report ☒

H. What is the current land use around the facility? Check all that apply:
Residential ☒ Industrial ☐ Commercial ☐ Agricultural ☒ Recreational ☒

I. Is there an actual or potential exposure to hazardous substances, pollutants or contaminants:

Ground Water: Yes ☐ No ☐ Potential ☒ Receptor:
Explain: Groundwater could be impacted, groundwater samples have not been collected.

Surface Water: Yes ☐ No ☐ Potential ☒ Receptor:
Explain: No surface water was observed onsite, nearby surface waters were not sampled.

Soil: Yes ☒ No ☐ Potential ☐ Receptor: Individuals living in houses adjacent to the site or people visiting the site.
Explain: Inhalation and dermal exposure are hazards to people on the subject property.

Waste: Yes ☐ No ☒ Potential ☐ Receptor:
Explain: No waste was identified in the vicinity of the site.

Air: Yes ☐ No ☒ Potential ☐
Explain: Air sampling is not monitored for the contaminants of concern.

J. Is there an actual or a potential for contamination of a drinking water well? Yes ☐ No ☐ Potential ☒

K. Are there hazardous substances, pollutants, or contaminants in drums, barrels, bulk storage containers, or tanks? Yes ☐ No ☒
Explain:

Kansas Department of Health and Environment
Pre-CERCLIS Site Evaluation Form

L. Are there high levels of hazardous substances in:
Near-surface soils (< 2 feet below surface)? Yes ☒ No ☐ Unknown ☐
Subsurface soils (> 2 feet below surface)? Yes ☐ No ☐ Unknown ☒
Surficial Waste present? Yes ☐ No ☒ Unknown ☐
Site Accessibility: Secure ☐ Access limited ☐ Readily accessible ☒ Worker population:
Further explanation:

M. Are there conditions on site that may be susceptible to impact from adverse weather? Yes ☐ No ☒
Explain:

N. Is there a threat of fire or explosion? Yes ☐ No ☒
Explain:

O. Is there a potential for other federal or state response programs? Yes ☒ No ☐
If a potential responsible party is identified the site could be addressed through another state or federal program.

P. Are there endangered species habitats, wetlands, or other sensitive environments nearby which may be adversely impacted by the site? Yes ☒ No ☐
Explain: The area is considered critical habitat for the endangered American Burying Beetle.

Q. Are there other situations or factors that warrant further CERCLA response? Yes ☐ No ☒
Explain:

R. Document economic conditions surrounding the site: agricultural

IV. CERCLA Site Screening Findings and Recommendations

A. CERCLA Eligible?

☒ Yes – further CERCLA evaluation is recommended. Cite applicable factors from Section III:
- ☒ A release of a hazardous substance, pollutant or contaminant has occurred;
- ☒ CERCLA Limitations on Response provisions do not apply;
- ☐ No responsible parties are willing/capable to respond at this time;
- ☐ Drums, barrels, and/or containers are, or may be present at the site;
- ☐ The site is susceptible to impact from adverse weather;
- ☐ No other federal or state response mechanisms were identified;
- ☒ The source is a facility as defined by the NCP;
- ☒ Contamination may be present in sufficient quantity and/or concentration;
- ☒ There is an actual or potential exposure threat;
- ☐ There is, or may be, a threat of fire or explosion;
- ☒ There are, or may be, high concentrations of contaminants in surficial soils;
- ☒ There are endangered species, wetlands, or other sensitive environments or receptors that may be impacted by the site.

☐ No - further CERCLA evaluation is not recommended. Cite appropriate factors from Section III:
- ☐ No release has occurred;
- ☐ Not a hazardous substance, pollutant or contaminant;
- ☐ Insufficient quantity or concentration:
- ☐ No actual or potential exposure threats;
- ☐ No high levels of contaminants in surficial soils:
- ☐ Not a facility or vessel;
- ☐ Subject to response limitations;
- ☐ Willing/capable responsible party response;
- ☐ Drums, barrels, and/or containers are, or may be present at the site;
- ☐ Site not susceptible to adverse weather:
- ☐ No threat of fire or explosion;
- ☐ Referred to another program.

B. Removal Action recommended? Yes ☐ No ☒
If yes, cite eligible conditions from § 300.410-300.415 of the NCP to warrant further removal site evaluation:

V. Definitions

I. **CERCLA** is the Comprehensive Environmental Response Compensation and Liabilities Act, 42 USC §9601 et seq. (as amended).

A **FACILITY** is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or any site or area, where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel.

A **HAZARDOUS SUBSTANCE** means any substance, element, compound, mixture, solution, hazardous waste, toxic pollutant, hazardous air pollutant, or imminently hazardous chemical substance or mixture designated pursuant to the Clean Water Act (CWA), CERCLA, Safe Drinking Water Act (SDWA), Clean Air Act (CAA) or Toxic Substances Control Act (TSCA). The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas.

The LIMITATIONS ON RESPONSE provisions of the NCP [40 CFR 300.400(b)] states that removals shall not be undertaken in response to a release: of a naturally occurring substance in its unaltered or natural form; from products that are a part of the structure of, and result in exposure within, residential buildings or business or community structures; or into public or private drinking water supplies due to deterioration of the system through ordinary use.

NCP is the National Oil and Hazardous Substances Pollution Contingency Plan 40 CFR §300-302.

POLLUTANT or CONTAMINANT includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions or physical deformations, in such organisms or their offspring. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas. [40 CFR 300.5]

A **RELEASE** is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant), but excludes: workplace exposures; engine exhaust emissions; nuclear releases otherwise regulated; and the normal application of fertilizer. For purposes of the NCP, release also means threat of release. [40 CFR 300.5]

A **VESSEL** is defined as every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel. [40 CFR 300.5]