TETRA TECH

November 24, 2009

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Quality Assurance Project Plan, Rev. 01**
Removal Action at the Pittsburg Zinc Site, Pittsburg, Kansas
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01, Task Order No. 0167
Task Monitor: Todd Campbell, On-Scene Coordinator

Dear Mr. Crossland:

The Tetra Tech EM Inc. Superfund Technical Assessment and Response Team (START) is submitting the attached revised Quality Assurance Project Plan (QAPP) for a removal action at the Pittsburg Zinc site in Pittsburg, Kansas. Responses to comments on a draft version of the QAPP noted by EPA Region 7 Quality Assurance personnel are included in red type. If you have any questions or comments, please contact the project manager at (913) 908-4649.

Sincerely,

for

Rick Claytor, CHMM
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

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X9004.09.0167.000

QUALITY ASSURANCE PROJECT PLAN FOR REMOVAL ACTION SUPPORT, REV. 01

PITTSBURG ZINC SITE, PITTSBURG, KANSAS

Superfund Technical Assessment and Response Team (START) 3
Contract No. EP-S7-06-01, Task Order No. 0167

Prepared For:

U.S. Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101

November 24, 2009

Prepared By:

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APPROVED BY:

for Rick Claytor, CHMM, START Project Manager	11-24-09 Date
Ted Faile, PG, CHMM, START Program Manager	11-24-09 Date
for Kathleen Homer, START Quality Assurance Manager	11-24-09 Date
Todd Campbell, EPA Project Manager, Superfund Division	Date
Diane Harris, EPA Quality Assurance Coordinator	Date

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1.0 PROJECT MANAGEMENT

1.1 DISTRIBUTION LIST

Region 7 EPA	Todd Campbell, Project Manager Diane Harris, Quality Assurance Coordinator
Region 7 START	Rick Claytor, Project Manager Ted Faile, Program Manager Kathleen Homer, Quality Assurance Manager

1.2 PROJECT, TASK ORGANIZATION, AND SCOPE OF WORK

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) 3 has been tasked by the U.S. Environmental Protection Agency (EPA) Superfund Division to provide technical support during a time-critical removal action at the Pittsburg Zinc site in Pittsburg, Kansas. Rick Claytor of Seagull Environmental Technologies will serve as the START Project Manager and will be responsible for ensuring implementation of this Quality Assurance Project Plan (QAPP) and making sure it is available to the field team at all times during sampling activities. Mr. Claytor will also provide periodic updates to EPA concerning the status of the project, as needed. Todd Campbell will be the EPA Project Manager for this activity.

A START field sampling team will (1) help EPA obtain access to properties for sampling, (2) acquire and calibrate sampling and monitoring equipment, (3) collect samples, (4) conduct field screening, (5) document property conditions and attainment of removal action levels (RAL), and (6) coordinate laboratory analyses. The START quality assurance (QA) manager will provide technical assistance, as needed, to ensure that necessary QA issues are adequately addressed.

Although an attempt will be made to adhere to this QAPP as much as possible, the proposed activities may be altered in the field if warranted by site-specific conditions and unforeseen hindrances that prevent any aspect of this QAPP from being implemented in a feasible manner. Such deviations will be recorded in the site logbook, as necessary. This QAPP will be available to the field team at all times during sampling activities to serve as a key reference for the proposed activities described herein.

1.3 PROBLEM DEFINITION, BACKGROUND, AND SITE DESCRIPTION

This QAPP was prepared by START to address imminent concerns that could impact human health and the environment at the Pittsburg Zinc site, where lead-contaminated soil was identified during previous sampling activities.

The Pittsburg Zinc site is located within the city limits of Pittsburg in Crawford County, Kansas (see Appendix A, Figure 1). Tetra Tech START conducted a comprehensive removal site evaluation (RSE) at the site from March through April 2009, with three additional properties sampled in July 2009. During this investigation, START sampled all properties where access had been obtained from property owners within the study area, including all schools, daycare centers, and public areas (parks) in the City, to assess the extent of lead contamination in surface soils. Soil samples from each property (169 properties were sampled) were screened by START with x-ray fluorescence (XRF) analyzers, and 10 percent of the samples were submitted for laboratory analysis of arsenic, cadmium, lead, and zinc.

Of the 169 properties assessed by START, 140 properties (82.8 percent) contained lead at concentrations below the EPA RAL of 550 milligrams per kilogram (mg/kg) for residential properties and daycare centers, and 1,000 mg/kg for commercial properties. XRF readings and laboratory data identified 29 residences (including vacant lots) and daycare centers (17.2 percent) where soils contained lead at concentrations greater than 550 mg/kg outside the drip zone. These data are based on the highest average XRF reading and laboratory data for lead within the area screened at each property.

1.4 PROJECT AND TASK DESCRIPTION

The activities described in this QAPP will address the following:

- Determination of post-excavation concentrations of metals in site soils to determine whether RALs have been achieved.
- Screening of additional properties (i.e., where access has been granted but not screened during previous investigations) concurrent with the removal activities to identify any other areas warranting removal action.

Relevant aspects of the project are described in the following sections of this QAPP.

1.5 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

The QA objective for this project is to provide valid data of known and documented quality. Specific data quality objectives are discussed in terms of accuracy, precision, completeness, representativeness, and comparability.

For this project, accuracy is defined as the ratio, expressed as a percentage, of a measured value to a true or reference value. The analytical component of accuracy will be expressed as percent recovery, based on the analysis of laboratory-prepared spike samples and performance evaluation audit samples. The accuracy of field screening measurements will be measured by routine assessment of field standards and by a comparison of screening data with laboratory results for split samples, as described in Section 2.5 of this QAPP.

Precision for this project is defined as a measure of agreement among individual measurements of laboratory-prepared duplicate samples. Because total method precision will not be determined for this project, no collocated samples will be collected.

Data completeness will be expressed as the percentage of data generated that is considered valid. A completeness goal of 100 percent will be applied to this project; however, if that goal is not met, site decisions may still be made based on the remaining data. No critical samples have been identified for the project.

Representativeness of collected samples is facilitated by establishing and following criteria and procedures identified in this QAPP.

1.6 SPECIAL TRAINING REQUIREMENTS AND CERTIFICATION

All site personnel will be required to have completed a basic 40-hour health and safety (Hazardous Waste Operations and Emergency Response) training course and annual refreshers. Familiarization with Niton XRF instruments and their operating procedures also will be necessary for the START team.

1.7 DOCUMENTATION AND RECORDS

A laboratory data submittal with accompanying narrative describing any problems or other issues with the analyses will be prepared in accordance with EPA Region 7 Standard Operating Procedure (SOP) 2410.10 and submitted to the EPA Project Manager.

START personnel will maintain a field logbook to record all pertinent activities associated with the sampling events. Appropriate documentation pertaining to photographs taken by START also will be recorded in the field logbook. Video documentation will be performed on all areas prior to any excavation and after backfilling is complete. Information pertaining to all samples (such as sampling dates and times, locations, and so on) collected during this event will be recorded on sample field sheets generated by EPA. Labels generated by EPA will be affixed to sample containers, identifying sample numbers, dates collected, and requested analyses. Chain-of-custody (COC) records will be completed and maintained for all samples from the time of their collection until they are submitted to the laboratory for analysis. A report describing the field activities will be prepared by START and submitted to EPA in both electronic (pdf) and hard-copy format following completion of the project and receipt of laboratory data. All START-generated documentation will be maintained with the project file at the Tetra Tech office in Kansas City, Missouri, until the end of the START 3 contract, when it will be transferred to EPA.

A health and safety plan (HASP) will be prepared by Tetra Tech START prior to field activities that will address site-specific hazards. The HASP will be reviewed and signed by all field personnel prior to field work, indicating that they understand the plan and its requirements. Copies of the plan will be available to all personnel throughout sampling activities.

2.0 MEASUREMENT AND DATA ACQUISITION

The following sections discuss provisions for measurement and acquisition of data.

2.1 SAMPLING PROCESS DESIGN

The sampling design proposed in the following subsections has been selected to fully identify the extent of soil contamination at the site and determine whether RALs have been achieved. Removal activities are anticipated to begin on October 26, 2009.

2.1.1 Assessment Screening Activities

During the removal action, screening of properties for possible lead contamination will continue to fully determine the extent of the area where removal action is warranted. This second phase of screening activities will be conducted at properties where access is granted in the expanded (Phase II) study area identified in the attached map (Appendix A, Figure 1). The proposed sampling scheme for this project will be judgmental (based on the best professional judgment of the sampling team), in accordance with

EPA Region 7 SOP 4230.19 and the *Superfund Lead-Contaminated Residential Sites Handbook* (EPA 2003). During the screening process, at least four cells will be established across each property. These cells will radiate out 100 feet from the drip zone around the home/building or until the property line is reached, whichever is less. The maximum size of each cell will be 100 by 100 feet; however, the actual size will be established in the field based on site features. Additional areas or cells that will be screened include the following: the drip zone; fine-grained material if used for driveways, sidewalks, or under carports; vegetable gardens; and children's play areas that are at least 25 by 25 feet. A composite sample consisting of nine aliquots, each collected from 0 to 2 inches below ground surface (bgs) (to get below the root zone), will be collected in each cell and placed in a labeled, sealed plastic bag. This procedure is contrary to SOP 4230.19, which indicates samples will be collected from the top 1 inch of soil.

All samples will be transported to a sample preparation facility and placed in clean, dedicated pie pans. The samples will be allowed to completely air dry. Once dried, the samples will be homogenized, passed through a number 10 (2 millimeter) sieve, and screened for lead using a XRF analyzer. Three XRF results will be recorded in the appropriate cell or area on the field sheet for that property. The average of the three readings will also be calculated and recorded on the field sheet. At least 10 percent of the screened soil samples will be submitted to the EPA Region 7 laboratory for confirmation analysis for arsenic, cadmium, lead, and zinc. Confirmation samples will be selected to represent the general range of XRF concentrations. XRF readings are generally considered valid screening level data if a comparison between the XRF values and the corresponding laboratory results yields a regression coefficient (r^2) of at least 0.7 (EPA 1994).

If a soil sample is identified by the XRF as having a lead concentration greater than 1,500 mg/kg, it will be submitted to the EPA Region 7 laboratory for analysis by the Toxicity Characteristic Leaching Procedure (TCLP) for arsenic, cadmium, and lead. Table 1 summarizes samples anticipated to be collected during the removal action.

2.1.2 Post-Excavation Screening Activities

EPA has established a time-critical RAL for lead in soil of 550 mg/kg for residential properties and daycare centers, and 1,000 mg/kg for commercial properties at this site. EPA will conduct removal activities at each property only after receipt of written consent from the property owner.

Initial removal activities in each contaminated cell will involve the excavation of approximately 6 inches of soil from the surface layer. This will be conducted with excavating machinery, such as skid loaders, dozers, excavators, backhoes, and hand tools. START will then collect in-situ XRF readings from the

excavated area. If XRF readings are consistently below 550 mg/kg, excavation will be considered complete for that cell. If XRF readings remain above 550 mg/kg, excavation will continue until readings of 550 mg/kg are identified. If soils exceed 550 mg/kg for lead at a depth of 24 inches, no further excavation will be conducted. EPA may choose to place a warning barrier if the lead concentration in soil below a 24-inch excavation depth remains above 550 mg/kg.

After removal of soils from the affected areas, and placement of warning barriers where required, the excavated soils will be replaced with clean backfill. Clean backfill will consist of soils with lead concentrations below 240 mg/kg, and with concentrations of all other hazardous substances, pollutants, or contaminants below soil screening levels determined by the EPA.

Garden soils that exceed 550 mg/kg of lead (based on discrete samples) will be excavated to a minimum depth of 24 inches. If soils at a depth of 24 inches exceed 550 mg/kg, excavation will continue in 6- to 12-inch lifts until lead concentrations fall below 550 mg/kg or EPA decides to cease excavation and place a warning barrier at the maximum excavated depth.

When the maximum depth of excavation is reached within a cell, START will collect a 9-aliquot composite sample from the upper 1 inch of soil and screen it for lead with a XRF analyzer. Samples from 10 percent of the screened cells will be selected and submitted for laboratory confirmation analysis of arsenic, cadmium, lead, and zinc.

To ensure borrow source material (backfill) is not contaminated, START will collect 9-aliquot samples from potential borrow source areas. Once dried, the samples will be homogenized and passed through a number 10 (2 millimeter) sieve. The homogenized samples will then be screened for lead using a Niton™ XRF. Three separate XRF readings will be taken from each sample and recorded on the field sheet for the appropriate cell of that borrow source area. The average of these three readings will be calculated and recorded on the appropriate field sheet. One sample will be submitted for laboratory analysis of metals regulated under the Resource Conservation and Recovery Act (RCRA) (including mercury), volatile organic compounds (VOC), and pesticides to confirm that backfill soils are not contaminated. Any additional samples collected from the borrow area will only be screened with the XRF. Table 1 summarizes samples anticipated to be collected during the removal action.

TABLE 1

ANTICIPATED SAMPLE SUMMARY

Matrix	Number of Samples		Laboratory Analyses
	Field Screening	Laboratory	
Soil (pre- & post-excavation)	800	80	Arsenic, cadmium, lead, zinc
Soil (XRF reading >1,500 mg/kg for lead)	15	15	TCLP arsenic, cadmium, lead
Soil (backfill)	5	1	RCRA metals, VOCs, pesticides

Notes:

mg/kg Milligrams per kilogram
RCRA Resource Conservation and Recovery Act
TCLP Toxicity Characteristic Leaching Procedure
VOC Volatile organic compound
XRF X-ray fluorescence

See Section 2.4 for details pertaining to laboratory analyses.

2.2 SAMPLING METHODS REQUIREMENTS

All required field equipment will be obtained by START prior to initiation of sampling activities. Corrective actions associated with field activities will be at the discretion of the EPA Project Manager whenever problems appear that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.

Table 2 references EPA Region 7 SOPs that will be followed during sample collection. An SOP for sampling surface soil, including backfill soil, is referenced for activities that may be conducted during the removal action.

TABLE 2

SUMMARY OF SAMPLING METHODS

Matrix	Sample Description	EPA Region 7 SOP Numbers
Soil	Surface soil, including backfill soil	4230.19

Notes:

EPA U.S. Environmental Protection Agency
SOP Standard Operating Procedure

START will address disposal of investigation-derived wastes (IDW) and procedures for personal decontamination in a separate site-specific health and safety plan. Most IDW will consist of disposable sampling supplies (gloves, paper towels, etc.) that will be disposed of off site as uncontaminated debris.

2.3 SAMPLE HANDLING AND CUSTODY REQUIREMENTS

Sample containers, preservatives, and holding times will comply with procedures defined in Region 7 EPA SOP No. 2420.06. Chain-of-custody procedures will be maintained as directed by Region 7 EPA SOP No. 2420.04. Samples will be accepted by the EPA Region 7 laboratory in accordance with Region 7 SOP No. 2420.01.

START will complete necessary paperwork for all samples, including chain-of-custody records that will accompany the coolers until delivery to the laboratory. If shipment of samples is required by a commercial courier, each cooler lid will be securely taped shut, and two custody seals will be signed, dated, and placed across the lid opening. Samples will be submitted to the laboratory in a timely manner to ensure that applicable holding times are not exceeded.

2.4 ANALYTICAL METHODS REQUIREMENTS

Samples will be analyzed at the EPA Region 7 laboratory, according to the EPA SOPs listed in Table 3. Detection limits typically associated with those SOPs are expected to be adequate for this activity. The requested analyses have been selected based on past sampling data and historical information collected for the site.

TABLE 3

ANALYTICAL METHODS

Analytical Parameter	EPA Method or Region 7 SOP Number
SOIL	
Total concentrations – arsenic, cadmium, lead, zinc; RCRA metals	SOP Nos. 3122.03 & 3121.23
TCLP concentrations – arsenic, cadmium, lead	SOP No. 3171.01
VOCs	Method 5035
Pesticides	SOP No. 3240.02

Notes:

EPA U.S. Environmental Protection Agency
SOP Standard Operating Procedure

2.5 QUALITY CONTROL REQUIREMENTS

Because dedicated supplies will be used for all soil samples (plastic bags, sampling gloves, stainless steel spoons, aluminum pans, etc.), no quality control (QC) samples will be required to assess potential for cross-contamination. Analytical error (precision and accuracy) will be assessed by the analysis of laboratory-prepared duplicates and spike samples. These criteria, along with other laboratory QC elements, will be performed in accordance with EPA SOPs.

To satisfy the QC evaluation criteria for the XRF data, START will compare the screening data with laboratory confirmation results. The mean of three XRF readings taken for each confirmation sample will be compared statistically to the laboratory result for each confirmation sample. For a given XRF instrument, the regression coefficient (r^2) between the XRF data and laboratory confirmation results should exceed 0.7 for the data from that XRF instrument to be considered quantitatively valid (EPA 1994). The XRF instruments also will be checked against known standards each day to assess analytical drift.

For every measurement, the Niton XRF has an uncertainty range that represents a 95 percent confidence interval. In general, precision and accuracy increase with increasing sample run time. The soil samples will be screened by the XRF for a minimum of 60 seconds.

2.6 INSTRUMENT, EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

START personnel will test, inspect, and maintain all sampling equipment and supplies, along with field screening instrumentation, prior to deployment for field activities. Testing, inspection, and maintenance of field instruments will be performed in accordance with manufacturers' recommendations. Testing, inspection, and maintenance of analytical instrumentation will be performed in accordance with EPA SOPs and manufacturers' recommendations.

2.7 INSTRUMENT CALIBRATION AND FREQUENCY

Calibration of the field screening and laboratory analytical instrumentation will be in accordance with the referenced SOPs and manufacturers' recommendations. Daily calibration checks of the XRF will be recorded in the site logbook.

2.8 INSPECTION AND ACCEPTANCE REQUIREMENTS FOR SUPPLIES AND CONSUMABLES

All sample containers will meet EPA criteria for cleaning procedures required for low-level chemical analysis. START will ensure the sample containers have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Sample Containers*. Certificates of cleanliness will be maintained in the START project file.

2.9 DATA ACQUISITION REQUIREMENTS

START has compiled previous data and information pertaining to the site (including other analytical data, reports, photographs, and maps referenced in this QAPP) from various sources. Some of that data have not been verified; however, such information will not be used for decision-making purposes without verification of its authenticity.

2.10 DATA MANAGEMENT

All laboratory data acquired during this activity will be managed in accordance with EPA Region 7 SOP No. 2410.01. START will manage field data using EPA-approved software, such as SCRIBE.

3.0 ASSESSMENT AND OVERSIGHT

3.1 ASSESSMENTS AND RESPONSE ACTIONS

Assessment and response actions pertaining to analytical phases of the project are addressed in EPA Region 7 SOP 2430.12. Corrective action will be taken at the discretion of the EPA Project Manager whenever problems appear that could adversely affect data quality or resulting decisions affecting future response actions pertaining to the site. The EPA Project Manager will oversee all field operations and initiate response actions as warranted by site conditions or an assessment of site data accuracy. No field audits are anticipated for this activity.

3.2 REPORTS TO MANAGEMENT

Following the completion of the field activities described herein, START will prepare a formal report for EPA that will include a description of sampling techniques, locations, and problems encountered (with resolutions to those problems); interpretation of analytical results; and validation of the laboratory data. The laboratory data for soil samples will be compared to all applicable or relevant and appropriate

requirements, including removal action levels established for the site, to determine whether further response is warranted.

4.0 DATA VALIDATION AND USABILITY

This section addresses data validation and usability.

4.1 DATA REVIEW, VALIDATION, AND VERIFICATION REQUIREMENTS

Data review and verification will be performed by a qualified laboratory analyst and the laboratory's section manager, in accordance with the laboratory's QA program. The EPA Project Manager will be responsible for overall validation and final approval of the data, in accordance with the projected use of the results.

4.2 VALIDATION AND VERIFICATION METHODS

The data will be validated in accordance with the laboratory's established SOPs. Laboratory personnel will perform QC spot checks, as needed. The EPA Project Manager will inspect the data to provide a final review. The EPA Project Manager will also compare sample descriptions with field sheets for consistency, and will ensure that any anomalies in the data are discussed with laboratory and/or START personnel to determine whether re-analysis or other action is warranted.

4.3 RECONCILIATION WITH USER REQUIREMENTS

The accuracy of XRF readings will be assessed by calculating the regression coefficient between XRF data and laboratory confirmation results. A regression coefficient of 0.7 will be required for the XRF readings to be considered acceptable screening level data. If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded, and re-sampling or re-analysis may be required.

5.0 REFERENCES

U.S. Environmental Protection Agency (EPA). 1994. Standard Operating Procedure for the Portable XRF Analyzer. ERT No. 4231.1707. December 2.

EPA. 2003. *Superfund Lead-Contaminated Residential Sites Handbook.* August.

APPENDIX A

FIGURES

INSET

EPA ID: 0118
Property Address: 304 East Rose Street
Sample Location: C1
XRF Result: 707 ppm

EPA ID: 0119
Property Address: 302 East Rose Street
Sample Location: C1, C2
XRF Result: 636, 627 ppm

EPA ID: 0117
Property Address: 306 East Rose Street
Sample Location: C1, C2
XRF Result: 558, 583 ppm

EPA ID: 0094
Property Address: 206 South Elm Street
Sample Location: C2
XRF Result: 722 ppm

EPA ID: 0070
Property Address: 303 East Euclid Street
Sample Location: C2
XRF Result: 806 ppm

EPA ID: 0185
Property Address: 211 South Elm Street
Sample Location: C1
XRF Result: 625 ppm

EPA ID: 0085
Property Address: 208 South Joplin Street
Sample Location: C2, Drip Zone
XRF Result: 736, 6130 ppm

EPA ID: 0101
Property Address: 305, 307 E. Euclid St.
Sample Location: C1
XRF Result: 572 ppm

EPA ID: 0096
Property Address: 302 South Elm Street
Sample Location: C2
XRF Result: 986 ppm

EPA ID: 0084
Property Address: 210 South Joplin Street
Sample Location: C2
XRF Result: 591 ppm

EPA ID: 0144
Property Address: 305 South Elm Street
Sample Location: C3
XRF Result: 491 ppm

EPA ID: 0068
Property Address: 301 East Euclid Street
Sample Location: C1
XRF Result: 783 ppm

EPA ID: 0097
Property Address: 303 South Elm Street
Sample Location: C3
XRF Result: 954 ppm

EPA ID: 0099
Property Address: 307 South Elm Street
Sample Location: C3
XRF Result: 579 ppm

EPA ID: 0145
Property Address: 311 South Elm Street
Sample Location: C4
XRF Result: 559 ppm

Scale: 1" = 180'

EPA ID: 0053
Property Address: 502 East 20th Street
Sample Location: C1
XRF Result: 509 ppm

Granby Mining & Smelter Company

EPA ID: 0076
Property Address: 811 North Joplin Street
Sample Location: C3, C4
XRF Result: 847, 1058 ppm

EPA ID: 0075
Property Address: 810 North Joplin Street
Sample Location: C2
XRF Result: 598 ppm

EPA ID: 0131
Property Address: 307 East 5th Street
Sample Location: Playground
XRF Result: 834 ppm

EPA ID: 0132
Property Address: 407 East 5th Street
Sample Location: C2
XRF Result: 585 ppm

EPA ID: 0141
Property Address: 921 East 5th Street
Sample Location: C1
XRF Result: 518 ppm

EPA ID: 0024
Property Address: 505 West 2nd Street
Sample Location: C5, C6, C7
XRF Result: 709, 606, 765 ppm

EPA ID: 0078
Property Address: 412 North Joplin Street
Sample Location: C1
XRF Result: 528 ppm

Pittsburg Zinc

EPA ID: 0125
Property Address: 403 North Smelter Street
Sample Location: C2
XRF Result: 700 ppm

S.H. Lanyon Smelter

EPA ID: 0171
Property Address: 807 East 4th Street
Sample Location: C1, C2, C3
XRF Result: 1009, 1634, 1467 ppm

EPA ID: 0147
Property Address: 210 North Elm Street
Sample Location: Gravel Drive
XRF Result: 720 ppm

EPA ID: 0121
Property Address: 306 East 3rd Street
Sample Location: C1, C2
XRF Result: 1239, 1393 ppm

EPA ID: 0027
Property Address: 207 West Rose Street
Sample Location: C4
XRF Result: 789 ppm

W&J Lanyon Smelter

See INSET

EPA ID: 0032
Property Address: 204 East Washington Street
Sample Location: Gravel drive
XRF Result: 651 ppm

Legend
- Phase I removal property
- Roads
- City limits
- Former smelter site
- Phase II assessment area
- 500 foot smelter site buffer

N

0 500 1,000
Feet

Source: NAIP Aerial Imagery, 2006
Approximate smelter locations; KDHE Phase II Focused Former Smelter Assessment of the Former W&J Lanyon Zinc Works Smelter, 2005
Roads; Crawford County GIS Department, 2008

Pittsburg Zinc Site
Pittsburg, Kansas

Figure 1
Phase I Removal Properties

TETRA TECH EM INC.

Date: 09/30/09 Drawn By: Bill Spiking Project No: I9004.L.08.0118.000

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