

**REMOVAL SITE EVALUATION (RSE) FOR THE  
CHERRYVALE RESIDENTIAL YARDS SITE,  
CHERRYVALE, MONTGOMERY COUNTY, KANSAS  
KDHE I.D. C306371097**

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**Removal Site Evaluation  
Cherryvale Residential Yards Site  
Cherryvale, Kansas  
March 2001  
KDHE/BER PROJECT #C306371097**

**KDHE/BER Project Manager:  
Randolph L. Brown, Environmental Geologist, Site Assessment Unit**

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**KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT (KDHE)  
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**CHERRYVALE RESIDENTIAL YARDS SITE  
REMOVAL SITE EVALUATION (RSE)  
TABLE OF CONTENTS**

SECTION 1.0: INTRODUCTION .....	1
1.1 Purpose .....	1
1.2 Site Description .....	1
1.3 Site History .....	1
1.4 Previous Investigations .....	3
SECTION 2.0: SITE GEOLOGY AND SOILS .....	4
2.1 Site Soils Description .....	4
2.2 Site Geology and Ground Water Pathway .....	4
2.3 Site Hydrology and Surface Water Pathway .....	5
SECTION 3.0: RSE FIELD ACTIVITIES .....	5
3.1 Background Soil Sampling .....	5
3.2 Residential Yard Sampling .....	5
SECTION 4.0: RSE ANALYTICAL RESULTS .....	6
4.1 Background Soil Sampling Sample Results .....	6
4.2 Residential Yard Sampling Results .....	7
4.3 Data Validation and Quality Control (QC) .....	8
SECTION 5.0: TARGETS AND SITE RISKS .....	9
SECTION 6.0: RSE SUMMARY AND CONCLUSIONS .....	9
6.1 Summary .....	9
6.2 Removal Response Considerations .....	10
6.3 Remedial Response Considerations .....	10
6.4 Enforcement Considerations .....	11
6.5 Conclusions .....	11
SECTION 7.0: REFERENCES .....	12
ATTACHMENTS:	
ATTACHMENT A: SITE FIGURES AND TABLES	
Figure 1: Site Location and Background Sample Locations	
Figure 2: X-ray Fluorescence Sample Results Summary	
Figure 3: Laboratory Sample Results Summary	
Tables 1(a) and 1(b): Summary of XRF Wet and Dried Sample Results	
Tables 2(a) and 2(b): Laboratory Sample Results	
Table 3: TCLP Results	
Table 4: Comparison of Laboratory, XRF Wet and Dried Analysis with Linear Regression Parameters Summary	
Tables 5(a) and 5(b): XRF Quality Control Parameters Summary	
ATTACHMENT B: PHOTOGRAPHIC DOCUMENTATION	
ATTACHMENT C: LABORATORY ANALYTICAL DATA	
ATTACHMENT D: FIELD XRF ANALYTICAL SHEETS	
ATTACHMENT E: PRELIMINARY REMOVAL SITE EVALUATION/ REMOVAL PRELIMINARY ASSESSMENT (PRE) FORM	
ATTACHMENT F: PORTIONS OF SANBORN MAPS	
ATTACHMENT G: RESIDENTIAL YARD SAMPLING FORMS	
ATTACHMENT H: PRE-CERCLIS CHECKLIST/INITIATION FORMS	

## **SECTION 1.0: INTRODUCTION**

### **1.1 Purpose**

This Removal Site Evaluation (RSE) was 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 Contingency Plan (NCP) 40 CFR § 300. The RSE was performed by the KDHE Bureau of Environmental Remediation (BER) as part of the cooperative agreement with EPA to conduct integrated assessment activities for the federal Fiscal Year (FY) 2000. The purpose of this RSE is to evaluate residential yards for the presence of heavy metal contaminants directly adjacent to the National Zinc site and to identify potential conditions eligible for removal response and/or further removal site evaluation consistent with §§ 300.410-300.415 of the NCP in these areas.

The RSE gathered additional information to support consideration of removal response actions consistent with § 300.300-310 and § 300.410-300.415 of the NCP. The RSE investigation included a site visit and sampling of private yards directly adjacent to the National Zinc site in Cherryvale, Montgomery County, Kansas. The National Zinc site has the EPA identification number (CERCLIS) of **KSD980406698**.

### **1.2 Site Description**

The RSE sampling area included the residential yards within a two-(2) block area at the southern edge of the National Zinc site. The Brownfields Targeted Assessment (BTA) did not determine the full extent of lead, cadmium and zinc contamination of surficial soils at the southern edge of the National Zinc site. The primary purpose of this RSE was thus intended therefore to conduct an initial screening of the residential yards in this area, namely Front and Martin Streets bounded by Coyle and School Streets on the east and west, respectively. The National Zinc site is located at the northwestern city limits of Cherryvale, Montgomery County, Kansas (see Figure 1) and is located along U.S. Highway 169. Cherryvale is a rural community with some light industry. The population of Cherryvale as of the last census was 2,464 persons (Reference 8). The geographic coordinates of the site are 39° 42' 30.0" North latitude and 96° 25' 00" West longitude. The site is located in Section 8 in Township 32 South, Range 17 East (Reference 1). Figure 2 illustrates the site location from aerial photographs.

### **1.3 Site History**

The National Zinc site consists of approximately 350 acres containing the former National Zinc smelter facility on the northern edge of Cherryvale, Kansas. Historical review from Sanborn Fire Insurance maps and historical archive information available during the BTA indicates that the Edgar Zinc Company began construction of a primary lead and zinc smelter at the site in 1898. The facility initially was

constructed with 1,800 retorts and 3 furnace buildings. By 1908 the smelter facility had 4,800 retorts and 24 furnaces. The 1928 Sanborn Map (the most recent available) also indicates the facility had four (4) massive ore roasters and 24 furnaces in operation, consistent with the 1908 configuration.

The Sanborn Maps indicate the facility as operating "day and night". This facility was recognized as the largest zinc smelter in the world until World War I. Nearly 500 employees worked at this facility at its peak, and the population of Cherryvale was nearly 8,000 during the early 1900s at the peak of the Edgar Zinc facility production. The Edgar Zinc facility was by far the largest employer and industrial facility in Cherryvale during its operational life. The location of the Frisco Railroad line at the eastern edge of the site in addition to plentiful shallow natural gas from oil and gas production in the local area provided the necessary transportation and energy resources for the operation of the Edgar Zinc facility. At least one half of the demand for primary zinc production was for galvanizing purposes. U.S. Steel Corporation may also have had some ownership interest in the Edgar Zinc Company around 1910. The facility operated as the Edgar Zinc Company until sometime after 1928, when it was reorganized as the National Zinc Company (References 6, 28, 29). Production appears to have declined through the 1930s when most active operations ceased.

Sludges and liquid wastes contaminated with heavy metals were contained in large settling ponds covering approximately 23 acres. The lagoons were used to contain runoff from an estimated 2,000 tons of slag and roasted ore. The National Zinc smelter facility permanently terminated operations on December 24, 1976. Presently, the site contains the encapsulated former lagoon, several abandoned buildings and building foundations, and the remains of the smelter operations.

Incidents of surface water contamination in the 1950s were reported to KDHE by adjacent property owners when contaminated water breached the large pond. On April 1976, the site was investigated by KDHE following complaints from farmers regarding visual surface water contamination in Drum Creek and concern over the possibility of a fish kill or cattle illness from surface water consumption. KDHE personnel also inspected the site on September 27, 1977 for possible surface water or ground water pollution associated with facility run-off and seeps. At the request of KDHE, limited response actions were initiated at the site by the National Zinc Company in October, 1977. Beginning in 1979, approximately 95 million gallons of fluid from the lagoon was treated and discharged into the adjacent Drum Creek. Ore and sludge was removed from the site; some of the remaining sludge (approximately 300 tons) was encapsulated on site. The lagoon was filled with dirt and top soil, treated with lime, and planted with grass. Five monitoring wells were installed in the western and southern edges of the large pond. Analytical results of ground water samples collected in 1982-1984 indicated high levels of cadmium and lead. A restrictive covenant limiting use or development of the property was prepared in 1983 and still governs the site.

In addition, KDHE inspected the site in May 1995 following a City of Cherryvale inquiry into possible restrictive covenant termination and redevelopment of the property. Surface water, soil, sediment, and

sludge/waste samples were obtained by KDHE personnel. Shallow ground water samples were also collected from existing monitoring wells installed around the lagoon. Laboratory analysis revealed contamination of sludge, soil and sediment samples of selected Resource Conservation and Recovery Act (RCRA) heavy metals above the non-residential Risk-Based Standards for Kansas (RSKs). Lead was detected at a maximum of 176,750 mg/kg (RSK = 1,000 mg/kg), cadmium at 2,816 mg/kg (RSK = 1,000 mg/kg), and arsenic at a maximum of 240 mg/kg (RSK = 38 mg/kg). Cadmium was detected in surface and ground water up to 0.111 mg/l, above its maximum contaminant level (MCL) of 0.005 mg/l. In July, 1996, sediment/sludge sampling indicated lead up to 1,786 mg/kg, above its non-residential RSK level of 1,000 mg/kg and cadmium in surface water up to 0.347 mg/l on-site in standing water. Preliminary Assessment (PA) and Site Inspection forms were completed by KDHE in 1981 and the site was assigned the CERCLA Identification System (CERCLIS) identification number KSD980406698. The PA/SI forms are included in Appendix L. The site is currently also in KDHE's Enforcement/Negotiation program to gather and review information pertaining to potential responsible parties (PRPs) for the National Zinc site.

The residential areas evaluated for the RSE were not part of the Edgar Zinc works and facility itself. According to historical Sanborn maps this area contained residential areas, the Edgar Chapel, the Cherryvale Butter and Cheese Factory and a hay and feed warehouse/store. Directly across Martin street to the north from the residential area was an ore store house, pattern storage and a "chemical laboratory" most likely performing assays on ore samples, (see Attachment F) which was part of the Edgar Zinc/National Zinc facility and was owned by National Zinc. From a review of available property ownership information, National Zinc owned the land immediately north of the residential area (National Zinc 'Tract 4") but did not appear to own the land now containing the residential area.

#### **1.4 Previous Investigations**

KDHE conducted extensive sampling of the National Zinc site during the Brownfields Targeted Assessment (BTA) Report. The BTA identified several data gaps in the surficial soil sampling, the largest being the area bounded by the residential properties evaluated for this RSE. The BTA Report was completed by KDHE in 1999 and approved by EPA in April, 2000. Approximately 659 *in-situ* X-ray fluorescence (XRF) soil analysis were conducted at the site during the 1999 BTA (this number does not include standards/calibration or other QC analyses). Of these, approximately 141 samples were submitted for laboratory analysis. Subsurface waste profile samples, surface water, sediment and ground water samples were also obtained at the site. Surface soil XRF detections ranged from non-detect through much of the northeastern and southwestern portions of the site to a maximum of 35,700 parts per million (ppm or mg/kg) lead at location N 6200 E 6700. Cadmium was not detected in excess of its 1,000 mg/kg non-residential RSK value, although it was detected above its residential RSK level of 39 mg/kg across nearly all of the areas also indicating elevated lead levels. Arsenic also exceeded its non-residential RSK value of 86 mg/kg, at a maximum concentration of 306 mg/kg.

## **SECTION 2.0: SITE GEOLOGY AND SOILS**

### **2.1 Soils**

The undisturbed areas of the site (primarily in the northeast half of the site) are typically underlain by the Kenoma series soils. The Kenoma soils are generally deep, moderately well drained, very slowly permeable soils on uplands, of 0 to 2 percent slopes. The surface layer (A horizon) typically consists of a dark grayish brown silt loam about 6-12 inches thick. The upper portion of the subsoil layer (B horizon) is typically 9 inches thick and consists of very dark grayish brown to grayish brown silty clay. The lower portion of the subsoil layer is typically 40 inches thick and consists of dark yellowish brown to dark brown to reddish brown silty clay. Typical depth of Kenoma soils averages 60 inches or greater. The southern edge of the site is also within the Dennis series, but the native soil profile for this series is very similar to the Kenoma series. No C horizon is recognized because of the generally deep (60 inches) thickness of these soil types.

The unified soil classification of the A horizon is CL to CL-ML to ML (18-29 % clay) with a plasticity index range of 3-18 and a liquid limit range of 24-40. The unified soil classification of the B horizon is CH (40-60 % clay) with a plasticity index range of 30-48 and a liquid limit range of 50-75. Available water content is high (0.10-0.24). Surface runoff is slow (0.2-0.06 in/hr) and shrink-swell potential is high, especially below 12 inches. Permeability generally ranges from 0.2 to 0.6 inches/hour (Reference 3).

### **2.2 Geology**

The site is located in a broad, low-relief upland of the Osage Questas physiographic area of southeast Kansas. Bedrock of Pennsylvanian age is present at the base of the soil profile. During the installation of temporary monitoring wells during at the National Zinc BTA, bedrock was typically encountered between 14 feet (TW-1) and 3.5 feet (TW-8).

The bedrock units underlying the site are believed to be composed of sandstone and limestone of the Cherryvale Shale and Dennis Limestone Formations of the Kansas City Group. A yellowish to reddish-brown sandstone was typically encountered as the bedrock layer upon auger refusal. Ground water occurrence within the Cherryvale Shale and Dennis Formations is typically localized with very low (less than 3 gallons per minute) yields of generally poor quality. These bedrock units typically yield little to no water except in the shallow weathered zone near the upper bedrock surface. Oil field intrusion of brines in the site area from oil production dating back to the early 1900s has impacted shallow ground water quality regionally in this portion of Southeast Kansas (Reference 4).

Ground water occurrence in the site area is primarily restricted to unconsolidated alluvial deposits of the Verdigris River and Cherry Creek. The City of Cherryvale receives water from a surface intake on Big

Hill Lake located approximately five (5) miles east of Cherryvale. Significant karst terrain does not exist in the site area given the sequential shale-sandstone-limestone stratigraphy of the bedrock units. The City of Cherryvale and Montgomery County Rural Water District # 12 supplies water to private residences surrounding the site.

### **2.3 Site Hydrology and Surface Water Pathway**

Drainage from the site is to the unnamed tributary which converges with the drainage from the National Zinc site approximately 500 feet north of Martin Street at the western end of the Cherryvale Yards site to the north of the former Cherryvale Rodeo Grounds. This unnamed tributary converges with Drum Creek approximately 3/4 mile to the west of U.S. 169 highway. The surface water pathway with regards to the National Zinc site will be discussed in greater detail in the National Zinc ESI Report.

## **SECTION 3.0: RSE FIELD ACTIVITIES**

The Phase II RSE field activities included: (1) a site visit, (2) collection of four (4) background soil samples to determine a statistical background mean, and (3) sampling of residential yards immediately adjacent to the National Zinc site in the area of concern. KDHE's Niton 733 X-ray fluorescence unit (XRF) was utilized to field analyze surficial soil and subsurface soil boring samples. A site-specific Quality Assurance Project Plan (QAPP) was developed and followed for the RSE activities.

### **3.1 Background Sampling**

Background samples were obtained at four (4) locations during the RSE. These were in locations either up- or side-wind of the former National Zinc site, topographically uphill and located in similar soil types. One sample was obtained from roughly the center of the Cherryvale City Park. Another sample was obtained approximately 50 feet northeast of the intersection of Roads 5200 and 5700 (Olive Street), another at the eastern edge of the city cemetery, and one approximately 50 feet southeast of the intersection of Carson Road and Grand Avenue. Samples were obtained with clean steel trowels from 0-6" and placed directly into prepared 4-oz glass jars. Laboratory analysis alone was performed to determine a definitive level for background range and thus XRF analysis was not performed on the background samples. Background samples were submitted to the KDHE's Division of Health and Environment Laboratory (DHEL) for RCRA metals analysis by EPA Methods 6010 and 7471 (mercury).

### **3.2 Residential Yard Sampling**

Eleven (11) residential yards were evaluated during the RSE. Samples were obtained by removing soil from 0-6" below ground surface at each sample location with a clean steel trowel and placing the sample

in a marked 1 quart zip-lock freezer bag. Samples were analyzed in the field with KDHE's Niton Model 733 X-ray fluorescence (XRF) analyzer using the  $^{109}\text{Cd}$  sealed radioactive source. A split laboratory sample was also obtained and placed in a 4-oz. prepared glass laboratory jar. Since cadmium or other constituents were not detected using the sealed  $^{241}\text{Am}$  source with interference from elevated lead levels, use of the  $^{241}\text{Am}$  source was discontinued early in the RSE field work. Laboratory samples were submitted to compare low, medium and higher XRF lead detections by EPA Method 6200 with laboratory results analyzed by EPA Method 6010. Bagged samples were also analyzed by XRF after a minimum of four (4) hours drying period in KDHE's laboratory soil sample drying oven at 60-80° C. All bagged XRF samples were analyzed by analyzing three (3) discrete locations across the bag and calculating a linear average between the three separate analyses per bag. The analysis time was reduced to 30 source seconds (Ss) early in the RSE as the difference in precision and accuracy from a 60 Ss analysis was not determined to be significant. A total of 54 wet and 57 dried samples were analyzed by XRF. A total of 170 separate analyses were performed on wet samples and 180 analyses were performed on dried samples (including field duplicates).

Trowels were decontaminated after each use by soaking in a deionized water and alcanox detergent solution, triple rinsing with deionized water and then drying with disposable paper towels prior to re-use. One rinsate sample was obtained from decontamination of sampling equipment during the RSE. The rinsate sample was submitted to DHEL for RCRA metals analysis. Laboratory samples were submitted to Continental Analytical Services (CAS) laboratory in Salina, Kansas for analysis by EPA Method 6010 (except mercury) and EPA Method 7471 (mercury). Toxicity Characteristic Leachate Procedure (TCLP) was also performed on selected laboratory samples, including the maximum detections. Laboratory samples were refrigerated until XRF analysis was completed and appropriate representative laboratory confirmation samples selected. A total of 19 laboratory samples were analyzed for a confirmatory rate of 33 % for both dried and undried (wet) samples.

## **SECTION 4.0: ANALYTICAL RESULTS**

### **4.1 Background Sample Results**

Background sample results are included in table form in Attachment A. A three times (3X) background concentration was calculated by determining the mean concentration of all of the background samples for the constituents detected. Lead, arsenic, and cadmium appear to be the primary constituents of concern at the site. The table also lists the 3X background maximum (3XMAX) concentration by multiplying the highest concentration for each constituent amongst the four (4) background samples by a factor of three (3). The lead 3X mean concentration was calculated to be 130.1 mg/kg, and the lead 3XMAX concentration was calculated to be approximately 627 mg/kg. The cadmium 3X mean concentration was calculated to be 2.6 mg/kg, and the 3XMAX concentration was calculated to be 16.6

mg/kg. The arsenic 3X mean concentration was calculated to be 6.7 mg/kg, and the 3XMAX concentration was calculated to be 24.0 mg/kg.

#### **4.2 Residential Yard Sample Results**

Every residential yard sampled during the RSE indicated lead levels in excess of KDHE's Risk-Based Levels for Kansas (RSKs) of 400 mg/kg for lead. A four-point (four discrete locations) background sampling strategy was utilized to determine mean background concentrations for lead, cadmium, chromium and mercury. Background sample locations are included in Figure 3.

XRF sample results are included in Figure 2, and laboratory sample results are included in Figure 3. The following residences indicated lead above 400 mg/kg in residential yard samples: 511 and 619 Martin, 509, 513, 520, 524, 610, 617, 618, 620, and 621 Front Street. 11 residential yards sampled during the RSE were identified with lead contamination in excess of the KDHE residential RSK level of 400 mg/kg. The maximum laboratory detection for lead was 3,680 mg/kg at 618 Front # 2. The maximum XRF detection for lead (dried) was 2,760 at 618 Front # 1 (laboratory value of 3,190 mg/kg). The 3XMAX lead concentration of 627 mg/kg was also exceeded in at least one sample in each of these yards. Samples obtained along the south side of Front Street also indicate that residential areas to the south of Front Street may also have lead levels in excess of 400 mg/kg. The full extent of impacted yards to the source of the site was not identified during this RSE. A Phase II RSE is recommended to further assess residential yards south to West First Street between Catherine and Coyle Streets to better define the area of impacted yards.

Cadmium was detected above its residential RSK of 39 mg/kg at 619 Martin # 5 (180 mg/kg), 618 Front #1 (41 mg/kg), 618 Front #2 (121 mg/kg) and in the alley south of Martin (Martin Alley #2) at 40.8 mg/kg. These cadmium levels are also in excess of the 3X MAX concentration of 16.2 mg/kg. The 3XMAX concentration for arsenic was calculated to be 24 mg/kg. Four (4) samples indicated levels above 3XMAX, 618 Front #1 (31.3 mg/kg), 618 Front #2 (33.7 mg/kg), 618 Front # 1 (26.8 mg/kg) and Martin Alley # 2 (31.4 mg/kg). Mercury was detected above its 3XMAX level of 0.3 mg/kg in several samples but was not detected at or above its residential RSK level of 2 mg/kg. The data collected for the RSE indicates that elevated levels of cadmium and arsenic are only present above residential RSKs and 3XMAX concentrations coincident with lead levels identified in excess of 1,000 mg/kg.

Toxicity Characteristic Leachate Procedure (TCLP) was performed on eight (8) samples for lead by EPA Method 1311. The maximum value detected was 4.97 mg/l on sample 610 Front #1, which is below the 5.0 mg/l TCLP threshold for lead established in § 261.24 of RCRA. This was also the only sample in excess of 3.0 mg/l TCLP lead in all of the TCLP samples. The soil would not likely be a RCRA characteristic hazardous waste (D008) when bulked and a composite sample obtained.

#### **4.3 Data Validation and Quality Control (QC) Sample Results**

A linear regression was calculated for the XRF vs. laboratory lead data obtained at the Cherryvale Residential Yards site. Both wet and dried samples were compared with the laboratory results. A coefficient of correlation of  $r^2 = 0.971$  was calculated for wet samples and a value of  $r^2 = 0.924$  was calculated for dried samples. According to EPA Method 6200, a coefficient of correlation of  $r^2 = 0.9$  or higher can be considered *quantitative definitive level data*. A coefficient of correlation of  $r^2 = 0.7$  to  $r^2 = 0.9$  can be considered *quantitative screening level data*. The coefficient of correlation for lead calculated for the Cherryvale Residential Yards site indicates that the XRF data obtained from the XRF analysis of bagged surficial soil samples (both in-field and later dried) during the RSE can be considered as approaching definitive level data since the coefficient of correlation is above 0.9.

A total of 13 field duplicates (5 wet and 8 dried) were analyzed with the Niton XRF unit during the RSE. The average relative standard deviation (RSD) was calculated to be 2.59 % for all field duplicate analyses during the RSE. The average RSD for all duplicate field analyses was well within the EPA Method 6200 20 % RSD acceptable value. The maximum RSD calculated was only 5.0 %. The percent difference (PD) between the National Institute of Standards and Testing (NIST) certified lead standards used during the RSE Niton XRF analyzed value indicated a maximum PD of 14.29 % and an average PD of 9.29 %. The acceptable PD proposed by EPA Method 6200 is also 20 %, and therefore all of the PD values measured as well as the average PD value during the RSE are within EPA Method 6200 acceptance criteria. A total of 22 NIST standards were also analyzed during the RSE. Since the inferential statistics for RSD and PD are within acceptance criteria for EPA Method 6200, all XRF data obtained during the Cherryvale Residential Yards RSE is accepted at 100 % completeness (Reference 12). No significant instrument or sampling QC problems were therefore identified during the RSE.

Laboratory data was validated consistent with KDHE's Quality Management Plan (QMP) by a member of the Site Assessment Unit of KDHE/BER who had no direct involvement with the acquisition of data for this project. Laboratory data was determined to be acceptable at 100 % completeness. A rinsate sample was collected during decontamination of steel trowels and submitted to the Division of Health and Environment Laboratories (DHEL) for analysis as an in-field QC sample. Lead, cadmium, and arsenic were not detected in the rinsate sample. Therefore no serious impact from cross-contamination of sampling equipment or compromise of QC parameters was identified from the RSE data.

#### **SECTION 5.0: TARGETS AND IDENTIFIED SITE RISKS**

The following residences indicated lead above 400 mg/kg in residential yard samples: 511 and 619 Martin, 509, 513, 520, 524, 610, 617, 618, 620, and 621 Front Street. 11 residential yards sampled during the RSE were identified with lead contamination in excess of the KDHE residential RSK level of

400 mg/kg. Using the 1990 census value of 2.42 persons per occupied household/housing unit, a value of 27 persons is calculated in excess of KDHE's residential RSK level for lead. Cadmium and arsenic were also detected above respective residential RSKs, but only in samples with coincident lead levels of 1,000+ mg/kg. Several of the residences were observed to have children either living at the residence or visiting daily. The full extent of impacted yards to the source of the site was not identified during this RSE. A Phase II RSE is recommended to further assess residential yards south to West First Street between Catherine and Coyle Streets to better define the area of impacted yards. Since the site is a residential area, access is not limited to impacted yard areas.

## **SECTION 6.0: RSE SUMMARY AND CONCLUSIONS**

### **6.1 Summary**

The RSE field activities included: (1) a site visit; (2) collection of background samples, and (3) sampling of residential yards adjacent to the National Zinc site. KDHE's Niton 733 X-ray fluorescence unit (XRF) was utilized to field analyze surficial soil samples. Multiple heavy metals, especially lead, arsenic and cadmium were identified to be present in residential yards in excess of background and KDHE residential RSK levels.

In addition, eleven (11) residences indicated areas of impacted surficial soil in residential yards above KDHE's residential RSK level of 400 mg/kg. Based on information gathered during the RSE, eligible conditions exist for further removal response consistent with §§ 300.410-300.415 of the NCP. The specific conditions identified at the site consistent with § 300.415(b)(2) are:

*Actual or potential exposure from oil releases or hazardous substances* exists at the site from elevated levels of primarily lead and cadmium from abandoned smelter operations. Private residential yards adjacent to the smelter works have been identified to be impacted with lead above residential RSKs (§ 300.415(b)(2)(i));

*Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released* is present since continued release of metals to surface water, soil and sediment will occur unless wastes are stabilized or covered; (§ 300.415(b)(2)(v));

*No KDHE or other State mechanism is in place* to address the wastes present at the site or impacted residential yards (§ 300.415(b)(2)(vii)); and

*Other factors* include the easy access to the site with no access or security limitations to the smelter site or areas of impacted residential yards (§ 300.415(b)(2)(viii)). Approximately 2,500 persons live within one mile of the site.

The site thus appears to qualify for further removal response actions at the site consistent with § 300.415 of the NCP considering the above factors from the NCP. Furthermore, the site may also qualify for further remedial response actions consistent with § 300.420-300.425 of the NCP (see Section 6.3 below). Initial response options and recommendations are discussed below.

### **6.2 Removal Response Considerations**

Removal response at the site should address impacted residential yards and areas of elevated lead levels along publically accessible areas of Front and Martin Streets. Potential response actions to impacted private yards include excavation or covering in those areas identified through this KDHE RSE Report. Maximum levels of lead detected at the site did not fail TCLP threshold criteria, and any removed soils should not need to be handled as potential RCRA characteristic hazardous waste (D008). High-volume (high-vol) air monitoring for heavy metal particulates should also be conducted before, during and after any response actions to assure transmission of heavy metals does not occur to nearby residents.

Additional sampling is also appropriate to evaluate additional residential yards potentially impacted by heavy metal contamination. Deeper soil sampling across the site may also assist in computing soil removal volumes if physical removal is contemplated, however deeper sampling will be of limited use if clean topsoil will be brought in to cover impacted areas instead (a common approach to addressing larger areas of impacted residential yards).

### **6.3 Remedial Response Considerations**

The Expanded Site Inspection (ESI) for the National Zinc site is also underway, and data from this RSE will be used to support ESI findings and conclusions consistent with § 300.420-300.425 of the NCP especially with regards to the soil pathway. The National Zinc site will be re-evaluated by the Hazard Ranking System (HRS) at the conclusion of the ESI to determine its eligibility for inclusion on the National Priorities List (NPL).

Response actions to residential yards should be consistent with the overall remedial actions for the National Zinc site. If the site is determined not to be eligible for NPL listing, the identified impacted residential yards should be addressed through further time-critical removal response consistent with the NCP. A more comprehensive target search and evaluation beyond the scope of this RSE will be conducted during the ESI to fully evaluate potential and actual target populations and environmental conditions impacted by releases or a threat of release of hazardous substances from the site. Eligibility of the site for inclusion on the National Priorities List (NPL) consistent with § 300.425 of the NCP may greatly influence the priority of future site-wide response actions.

#### **6.4 Enforcement Considerations**

An initial search of potentially responsible parties (PRPs) has been completed by EPA Region VII. No viable PRPs have been identified to date. EPA may elect to continue PRP search activities after completion of the ESI/HRS/NPL listing and/or removal response activities.

#### **6.5 Conclusions**

Contamination in residential yards identified in this RSE appears to present a significant threat to human health and the environment from actual or potential releases or threat of release of hazardous substances, especially lead, cadmium and arsenic, to residents in the area of the site. Releases of heavy metals have been attributed to the National Zinc site located directly adjacent to the north of the residential area targeted for this RSE. Removal response actions at these private yards are recommended to be the first priority for removal response actions at the site.

Further removal site evaluation consistent with § 300.415 of the NCP is recommended to further evaluate residential yards south of the area identified in this RSE. KDHE is currently in the planning stages of the Phase II RSE to evaluate yards south to First Street between Catherine and Coyle Streets.

The site may also qualify for further remedial site assessment consistent with § 300.420 of the NCP. The results of this RSE and previous data will be used by KDHE to update and re-evaluate the Hazard Ranking System II (HRS II) Pre-Score and in completing the ESI to determine if the entire National Zinc site is a candidate for listing on the National Priorities List (NPL) consistent with § 300.420-300.425 of the NCP. Given the size and nature of the site, response actions site-wide may be more appropriately addressed through listing the site on the NPL if a cooperative PRP is not identified to conduct response actions under KDHE or EPA oversight.

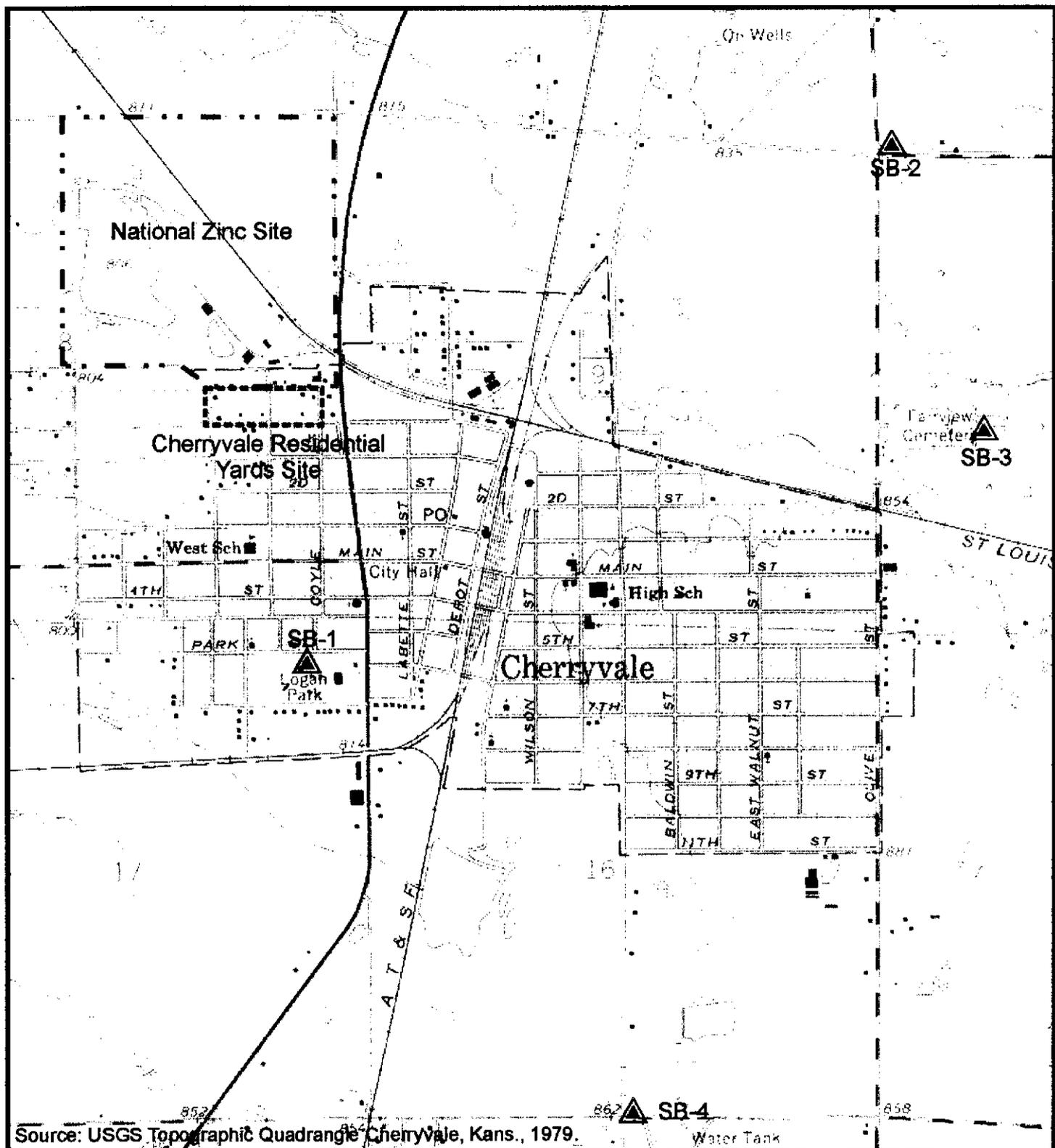
**SECTION 7.0: REFERENCES**

1. U.S. Geological Survey, 7.5-minute topographic quadrangle maps of Kansas: Cherryvale, Kansas, 1962, photorevised 1979.
2. U.S. Environmental Protection Agency, *Standard Operating Procedure to Determine Site Latitude and Longitude Coordinates*, 1991.
3. U.S. Department of Agriculture, *Soil Survey of Montgomery County, Kansas*, 1980.
4. Kansas Geological Survey, *Geology and Ground Water Resources of Montgomery County, Kansas*, Bulletin Ground Water Series #1 (GW-1), 1974.
5. KDHE Interviews with Mr. Roy Riedner, City Manager of Cherryvale, May-December, 1999.
6. May Jane Blades, *Cherryvale Industries*, 1996.
7. Kansas Department of Health and Environment, Division of Environment, Bureau of Water, Well Record Forms WWC-5 KSA 82a-1212.
8. U.S. Department of Commerce, *1990 Household, Family, and Group Quarters Characteristics*.
9. Kansas Rural Water Association/Kansas Water Office/Kansas Department of Health and Environment, *Rural Water Districts in Kansas*, 1994.
10. Kansas Board of Agriculture, Division of Water Resource, Water Rights Data Base, Amounts/Statistics, 1999.
11. Kansas Department of Transportation State and County Maps and Aerial Photographs.
12. Federal Emergency Management Agency, Flood Maps for Montgomery County, 1992.
13. Kansas Department of Health and Environment (KDHE) Bureau of Water (BOW) Public Water Supply Files.
14. Kansas Department of Health and Environment (KDHE) Bureau of Waste Management (BWM) Files.
15. Kansas Department of Health and Environment (KDHE) Bureau of Environmental Remediation (BER) Files.

16. U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry:  
*Draft Toxicological Profile for Lead*, May, 1994;  
*Draft Toxicological Profile for Cadmium*, May, 1994.  
*Draft Toxicological Profile for Arsenic*, May, 1994.  
*Draft Toxicological Profile for Chromium*, May, 1994.  
*Draft Toxicological Profile for Silver*, May, 1994.  
*Draft Toxicological Profile for Barium*, May, 1994.
17. U.S. Environmental Protection Agency, *Guidance for Conducting Preliminary Assessments under CERCLA*, EPA/OSWER 540/G-91/013, 1991.
18. U.S. Environmental Protection Agency, *Guidance for Performing Site Inspections under CERCLA*, EPA/OSWER 9345.1-05, 1992.
19. U.S. Environmental Protection Agency, *Hazard Evaluation Manual: A Guide to Removal Actions*, EPA Region III, 1993.
20. U.S. Environmental Protection Agency, *Quality Assurance/Quality Control Guidance for Removal Activities*, EPA/540/G-90/004, 1990.
21. Kansas Department of Health and Environment, Bureau of Environmental Remediation, *Brownfields Targeted Assessment of the National Zinc Site*, CERCLIS I.D. # KSD980406698, December, 1999.
22. U.S. Environmental Protection Agency, Office of Solid Waste, Method 6200: *Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soils and Sediment* (EPA Method 6200), 1998.
23. U.S. Environmental Protection Agency, *Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA*, EPA/540/R-93/057, 1993.
24. U.S. Environmental Protection Agency, *Superfund Removal Procedures*, EPA/OSWER /9360.3-01, 1990.
25. U.S. Environmental Protection Agency, *Guidance for Data Usability in Site Assessment*, EPA/OSWER/9345.1-05, 1993.
26. Kansas Department of Health and Environment, *Quality Assurance Project Plan (QAPP) for the Removal Site Evaluation (RSE) of the Cherryvale Residential Yards Site*, KDHE/BER, February, 2001.

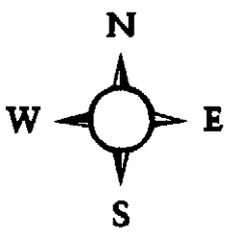
# ATTACHMENT A

## FIGURES AND TABLES



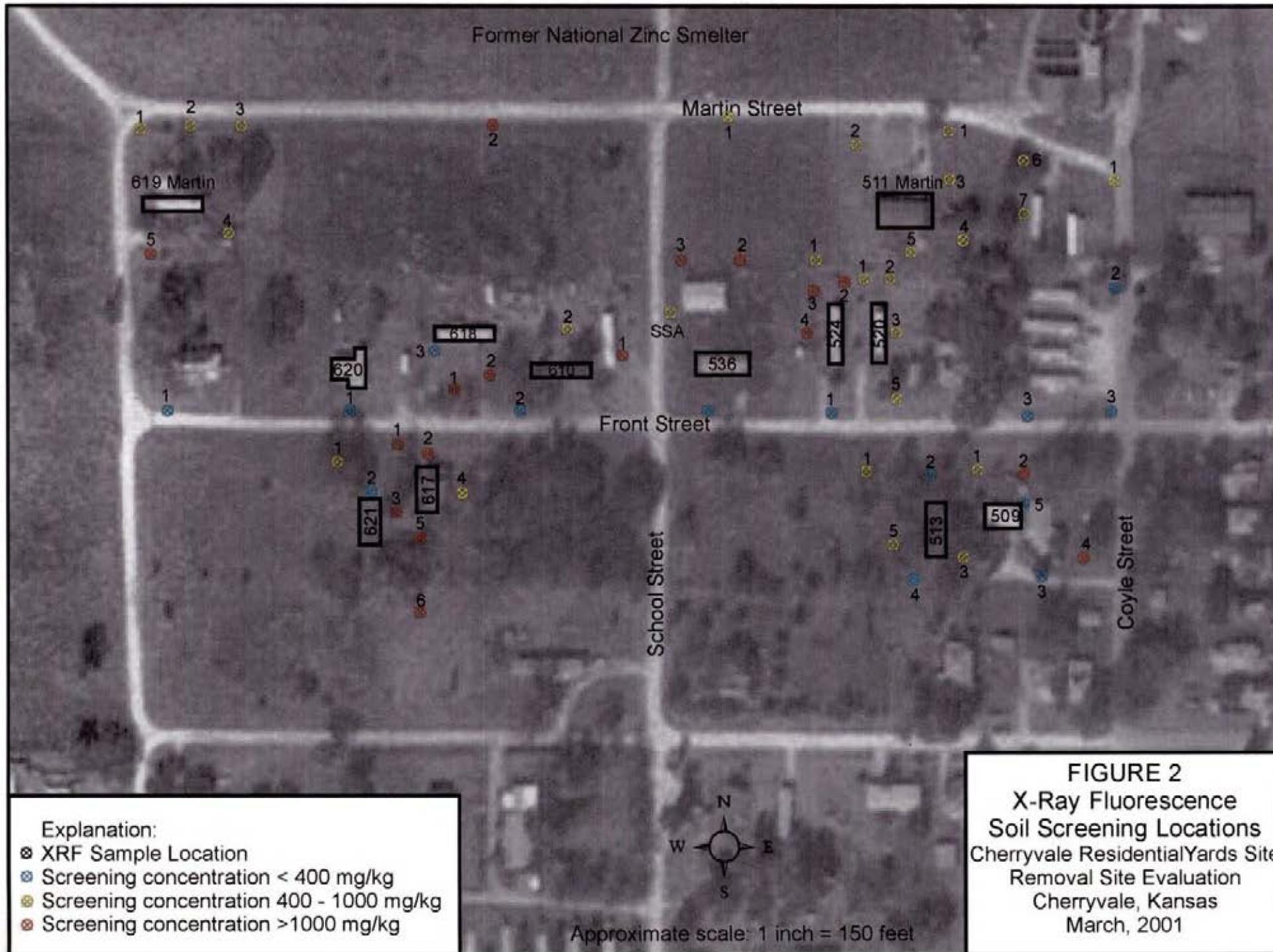
**FIGURE 1  
SITE AREA MAP  
WITH SOIL BACKGROUND  
SAMPLE LOCATIONS**

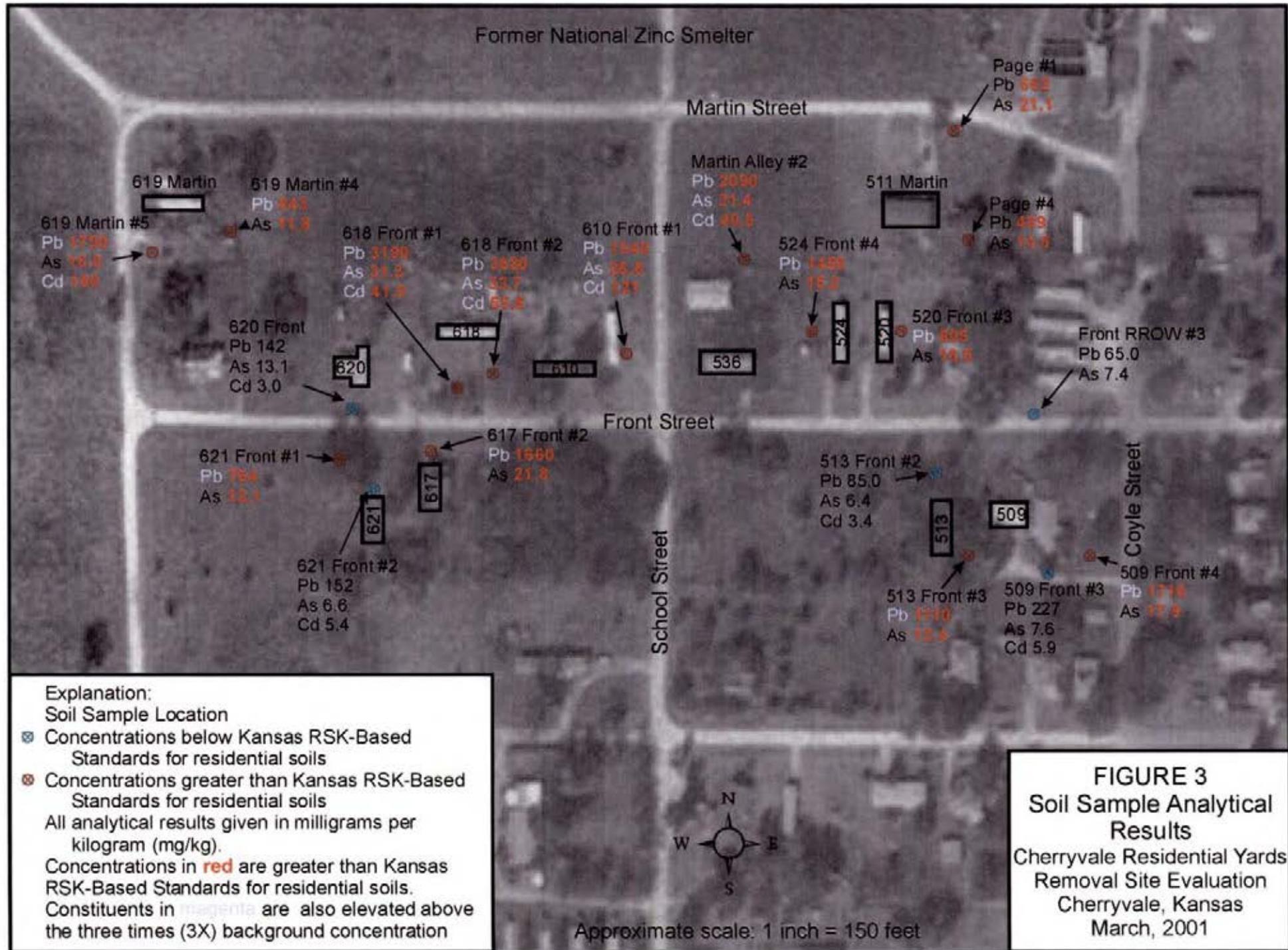
Cherryvale Residential Yards Site  
Removal Site Evaluation  
Cherryvale, Kansas  
March 2001



Approximate Scale: 1 inch = 1400 feet

 SB- Background Soil Sample Location





**Table 1(a)**  
**Surficial Soil X-Ray Fluorescence (XRF)**  
**Analysis Data Summary (Wet Samples)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (Wet) (mg/kg):	Comments/Three Point Average Concentration:
509 Front #1	31	Cd-109	723 ± 61	
509 Front #1	32	Cd-109	413 ± 37	
509 Front #1	34	Cd-109	506 ± 51	Ave.= 547.3
509 Front #2	31	Cd-109	542 ± 57	
509 Front #2	31	Cd-109	752 ± 75	
509 Front #2	31	Cd-109	595 ± 60	Ave.= 629.7
509 Front #5	31	Cd-109	295 ± 45	
509 Front #5	31	Cd-109	257 ± 42	
509 Front #5	35	Cd-109	349 ± 49	Ave.=300.3
513 Front #1	63	Cd-109	485 ± 65	
513 Front #1	34	Cd-109	472 ± 49	
513 Front #1	39	Cd-109	426 ± 53	Ave.=461.0
513 Front #2	32	Cd-109	75.1 ± 29	
513 Front #2	35	Cd-109	113 ± 30	
513 Front #2	32	Cd-109	51 ± 25	Ave.=79.7
513 Front #3	34	Cd-109	839 ± 62	Lab Sample
513 Front #3	34	Cd-109	520 ± 49	
513 Front #3	38	Cd-109	513 ± 50	Ave.=624.0
513 Front #4	31	Cd-109	247 ± 45	
513 Front #4	31	Cd-109	276 ± 45	
513 Front #4	31	Cd-109	254 ± 40	Ave.=259.0
513 Front #5	31	Cd-109	271 ± 44	
513 Front #5	31	Cd-109	327 ± 46	
513 Front #5	45	Cd-109	324 ± 37	Ave.= 307.3
520 Front #1	41	Cd-109	647 ± 52	
520 Front #1	31	Cd-109	611 ± 61	

**Table 1(a)(continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (Wet) (mg/kg):	Comments/Three Point Average Concentration:
520 Front #1	31	Cd-109	456 ± 56	Ave.= 571.3
520 Front #3	31	Cd-109	492 ± 55	Lab Sample
520 Front #3	31	Cd-109	460 ± 54	
520 Front #3	41	Cd-109	630 ± 52	Ave.= 527.3
520 Front #5	34	Cd-109	859 ± 75	
520 Front #5	34	Cd-109	259 ± 36	
520 Front #5	37	Cd-109	1090 ± 74	
520 Front #5	34	Cd-109	994 ± 75	Ave.= 800.5 (Duplicate)
524 Martin #1	49	Cd-109	176 ± 28	(Actual address 524 Front)
524 Martin #1	31	Cd-109	180 ± 38	
524 Martin #1	31	Cd-109	146 ± 43	Ave.= 167.3
524 Front #2	31	Cd-109	1090 ± 85	
524 Front #2	31	Cd-109	506 ± 48	
524 Front #2	34	Cd-109	470 ± 45	Ave.= 688.7
524 Front #3	37	Cd-109	723 ± 56	Lab Sample
524 Front #3	31	Cd-109	409 ± 45	
524 Front #3	31	Cd-109	1000 ± 80	Ave.= 710.7
524 Front #4	34	Cd-109	666 ± 94	
524 Front #4	31	Cd-109	966 ± 69	
524 Front #4	31	Cd-109	618 ± 50	Ave.= 750.0
536 Martin	31	Cd-109	134 ± 31	(Actual address 536 Front)
536 Martin	31	Cd-109	161 ± 37	
536 Martin	31	Cd-109	144 ± 34	Ave.= 146.3
610 Front #1	34	Cd-109	804 ± 71	Lab Sample
610 Front #1	37	Cd-109	818 ± 68	
610 Front #1	33	Cd-109	913 ± 74	Ave.= 845.0
610 Front #2	31	Cd-109	488 ± 61	
610 Front #2	34	Cd-109	319 ± 35	

**Table 1(a)(continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (Wet) (mg/kg):	Comments/Three Point Average Concentration:
610 Front #2	35	Cd-109	317 ± 34	Ave.= 374.7
617 Front #1	37	Cd-109	1150 ± 65	
617 Front #1	34	Cd-109	1280 ± 84	
617 Front #1	33	Cd-109	1330 ± 76	Ave.= <b>1,253.3</b>
617 Front #2	34	Cd-109	724 ± 54	Lab Sample
617 Front #2	34	Cd-109	837 ± 60	
617 Front #2	31	Cd-109	861 ± 73	Ave.= <b>807.3</b>
617 Front #3	31	Cd-109	523 ± 55	
617 Front #3	31	Cd-109	637 ± 67	
617 Front #3	31	Cd-109	740 ± 81	Ave.= <b>633.3</b>
617 Front #4	38	Cd-109	495 ± 51	
617 Front #4	35	Cd-109	512 ± 52	
617 Front #4	31	Cd-109	766 ± 66	Ave.= <b>591.0</b>
617 Front #5	37	Cd-109	1530 ± 90	
617 Front #5	34	Cd-109	2000 ± 100	
617 Front #5	31	Cd-109	867 ± 76	Ave.= <b>1,465.6</b>
617 Front #6	31	Cd-109	928 ± 60	
617 Front #6	31	Cd-109	812 ± 66	
617 Front #6	34	Cd-109	971 ± 68	
617 Front #6	31	Cd-109	800 ± 65	Ave.= <b>877.8</b>
618 Front #1	34	Cd-109	2050 ± 100	Lab Sample
618 Front #1	34	Cd-109	1240 ± 74	
618 Front #1	34	Cd-109	2460 ± 110	Ave.= <b>1,916.7</b>
618 Front #2	33	Cd-109	1780 ± 94	Lab Sample
618 Front #2	33	Cd-109	1790 ± 96	
618 Front #2	33	Cd-109	1850 ± 97	Ave.= <b>1,806.7</b>
618 Front #3	31	Cd-109	77 ± 27	

**Table 1(a)(continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (Wet) (mg/kg):	Comments/Three Point Average Concentration:
618 Front #3	31	Cd-109	81.5 ± 25	
618 Front #3	31	Cd-109	1150 ± 82	
618 Front #3	38	Cd-109	1100 ± 73	
618 Front #3	31	Cd-109	104 ± 26	Ave.= 502.5
621 Front #1	31	Cd-109	435 ± 47	Lab Sample
621 Front #1	41	Cd-109	416 ± 40	
621 Front #1	42	Cd-109	365 ± 41	Ave.= 405.3
621 Front #2	34	Cd-109	49.3 ± 21	Lab Sample
621 Front #2	35	Cd-109	142 ± 31	
621 Front #2	35	Cd-109	124 ± 29	Ave.= 105.1
619 Martin #4	31	Cd-109	593 ± 57	Lab Sample
619 Martin #4	31	Cd-109	593 ± 54	
619 Martin #4	37	Cd-109	718 ± 55	Ave.= 634.7
619 Martin #5	41	Cd-109	834 ± 79	
619 Martin #5	31	Cd-109	1300 ± 74	
619 Martin #5	31	Cd-109	877 ± 88	Ave.= 1,003.7
620 Martin	31	Cd-109	50.9 ± 19	Lab Sample
620 Martin	31	Cd-109	86.4 ± 27	
620 Martin	31	Cd-109	113 ± 30	Ave.= 83.4
Page #1	62	Cd-109	333 ± 30	Lab Sample
Page #1	61	Cd-109	485 ± 37	
Page #1	61	Cd-109	543 ± 38	Ave.= 453.7
Page #2	61	Cd-109	397 ± 31	
Page #2	61	Cd-109	496 ± 39	
Page #2		Cd-109	420 ± 42	Ave.= 437.7
Page #3	62	Cd-109	450 ± 38	
Page #3	62	Cd-109	615 ± 45	
Page #3	62	Cd-109	388 ± 38	Ave.= 484.3

**Table 1(a)(continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (Wet) (mg/kg):	Comments/Three Point Average Concentration:
Page #4	62	Cd-109	474 ± 38	Lab Sample
Page #4	62	Cd-109	463 ± 36	
Page #4	62	Cd-109	412 ± 35	Ave.= 449.7
Page #5	62	Cd-109	415 ± 36	
Page #5	62	Cd-109	548 ± 42	
Page #5	62	Cd-109	606 ± 45	Ave.= 523.0
Page #6	34	Cd-109	497 ± 49	
Page #6	34	Cd-109	586 ± 53	
Page #6	34	Cd-109	654 ± 57	Ave.= 579.0
Page # 7	31	Cd-109	275 ± 35	
Page # 7	31	Cd-109	434 ± 46	
Page # 7	31	Cd-109	328 ± 38	Ave.= 345.7
Martin Alley #1	31	Cd-109	360 ± 47	
Martin Alley #1	31	Cd-109	640 ± 64	
Martin Alley #1	32	Cd-109	542 ± 66	Ave.= 514.0
Martin Alley #2	31	Cd-109	1070 ± 97	Lab Sample
Martin Alley #2	31	Cd-109	1070 ± 100	
Martin Alley #2	31	Cd-109	1040 ± 89	(Duplicate)
Martin Alley #2	31	Cd-109	1330 ± 96	Ave.= 1,127.5
Martin Alley #3	30	Cd-109	1430 ± 99	
Martin Alley #3	33	Cd-109	1630 ± 100	
Martin Alley #3	33	Cd-109	1520 ± 96	Ave.= 1,526.7
School S. Alley	32	Cd-109	361 ± 56	
School S. Alley	32	Cd-109	300 ± 43	
School S. Alley	32	Cd-109	334 ± 47	Ave.= 331.7
Coyle #1	31	Cd-109	310 ± 47	
Coyle #1	31	Cd-109	254 ± 42	

**Table 1(a)(continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (Wet) (mg/kg):	Comments/Three Point Average Concentration:
Coyle #1	31	Cd-109	249 ± 41	
Coyle #1	34	Cd-109	233 ± 37	Ave.= 261.5 (Duplicate)
Coyle #2	31	Cd-109	360 ± 55	
Coyle #2	35	Cd-109	310 ± 49	
Coyle #2	89	Cd-109	318 ± 33	Ave.= 329.3
Coyle #3	31	Cd-109	160 ± 37	
Coyle #3	32	Cd-109	104 ± 33	
Coyle #3	32	Cd-109	179 ± 42	Ave.= 147.7
W Martin #1	34	Cd-109	405 ± 46	
W Martin #1	35	Cd-109	505 ± 56	
W Martin #1	34	Cd-109	284 ± 47	Ave.= 398
W. Martin #2	31	Cd-109	430 ± 50	
W. Martin #2	31	Cd-109	468 ± 49	(Duplicate)
W. Martin #2	31	Cd-109	585 ± 69	
W. Martin #2	31	Cd-109	573 ± 64	Ave.= 514.0
W Martin #3	31	Cd-109	705 ± 67	
W Martin #3	34	Cd-109	473 ± 56	
W Martin #3	31	Cd-109	823 ± 72	Ave.= 667.0
Martin #1	31	Cd-109	702 ± 75	
Martin #1	34	Cd-109	563 ± 61	
Martin #1	33	Cd-109	1070 ± 88	Ave.= 778.3
Martin #2	33	Cd-109	1010 ± 84	
Martin #2	33	Cd-109	1280 ± 41	
Martin #2	35	Cd-109	944 ± 81	Ave.= 1,078.0
Martin RROW W School #1	31	Cd-109	107 ± 31	
Martin RROW W School #1	31	Cd-109	88.1 ± 30	
Martin RROW W School #1	31	Cd-109	87.2 ± 28	Ave.= 94.1
Martin RROW West School	32	Cd-109	179 ± 45	

**Table 1(a)(continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (Wet) (mg/kg):	Comments/Three Point Average Concentration:
Martin RROW West School	34	Cd-109	191 ± 37	
Martin RROW West School	31	Cd-109	189 ± 37	Ave.= 189.3
Martin RROW West School	31	Cd-109	198 ± 40	(Duplicate)
Front RROW East School #3	31	Cd-109	144 ± 38	
Front RROW East School #3	31	Cd-109	88.8 ± 24	
Front RROW East School #3	31	Cd-109	110 ± 33	Ave.= 114.3

Notes: All analyses conducted February and March, 2001. Results in milligrams per kilogram (mg/kg). Results in **bold** indicate levels greater than the KDHE RSK residential lead soil standard of 400 mg/kg. All analyses conducted according to EPA Method 6200 on wet samples (not oven-dried) with imprecision indicated as ± in mg/kg. Samples collected 0-6" depth. Average concentration calculated with simple three (3)-point average.

**Table 1(b)**  
**Surficial Soil X-Ray Fluorescence (XRF)**  
**Analysis Data Summary (Dried Samples)**  
**Cherryvale Residential Yards Removal Site Evaluation**

Sample I.D.:	Run Time (Ss):	Source:	Lead (mg/kg):	Comments/Three Point Average Concentration:
509 Front #1	31	Cd-109	752 ± 84	
509 Front #1	31	Cd-109	842 ± 81	
509 Front #1	31	Cd-109	986 ± 91	Ave.= 860.0
509 Front #2	34	Cd-109	1,040 ± 91	
509 Front #2	33	Cd-109	1,400 ± 100	
509 Front #2	34	Cd-109	1,180 ± 110	Ave.= 1,206.7
509 Front #3	31	Cd-109	298 ± 46	Lab Sample
509 Front #3	31	Cd-109	237 ± 44	
509 Front #3	31	Cd-109	254 ± 47	Ave.= 263.0
509 Front #4	34	Cd-109	1,430 ± 110	Lab Sample
509 Front #4	44	Cd-109	1260 ± 83	
509 Front #4	34	Cd-109	1,540 ± 110	Ave.= 1,410.0
509 Front #5	31	Cd-109	456 ± 61	
509 Front #5	31	Cd-109	354 ± 54	
509 Front #5	31	Cd-109	358 ± 59	Ave.= 389.3
513 Front #1	31	Cd-109	365 ± 54	
513 Front #1	31	Cd-109	1,040 ± 85	
513 Front #1	31	Cd-109	682 ± 72	Ave.= 695.7
513 Front #2	31	Cd-109	57 ± 30	
513 Front #2	31	Cd-109	98.2 ± 33	
513 Front #2	34	Cd-109	114 ± 41	Ave.= 89.7
513 Front #3	31	Cd-109	880 ± 87	Lab Sample
513 Front #3	37	Cd-109	859 ± 71	
513 Front #3	31	Cd-109	759 ± 82	Ave.= 832.7
513 Front #4	31	Cd-109	196 ± 34	

**Table 1(b) (continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (mg/kg):	Comments/ Average Concentration:
513 Front #4	31	Cd-109	297 ± 54	
513 Front #4	31	Cd-109	334 ± 57	Ave.= 275.7
513 Front #5	34	Cd-109	414 ± 59	
513 Front #5	35	Cd-109	375 ± 61	
513 Front #5	35	Cd-109	422 ± 58	Ave.= 403.7
520 Front #1	34	Cd-109	722 ± 77	
520 Front #1	34	Cd-109	711 ± 81	
520 Front #1	34	Cd-109	685 ± 73	Ave.= 706.0
520 Front #2	35	Cd-109	224 ± 60	
520 Front #2	44	Cd-109	669 ± 66	
520 Front #2	31	Cd-109	357 ± 63	Ave.= 415.0
520 Front #3	34	Cd-109	930 ± 63	Lab Sample
520 Front #3	34	Cd-109	914 ± 84	
520 Front #3	34	Cd-109	1,050 ± 87	Ave.= 996.0
520 Front #3	41	Cd-109	1,090 ± 82	(Duplicate)
520 Front #5	34	Cd-109	1,180 ± 100	
520 Front #5	35	Cd-109	850 ± 100	
520 Front #5	34	Cd-109	544 ± 77	Ave.= 858.0
524 Martin #1	31	Cd-109	282 ± 55	(Actual address 524 Front)
524 Martin #1	34	Cd-109	213 ± 55	
524 Martin #1	34	Cd-109	204 ± 45	Ave.= 233
524 Front #2	35	Cd-109	723 ± 98	
524 Front #2	34	Cd-109	968 ± 85	
524 Front #2	34	Cd-109	1,360 ± 110	Ave.= 1,017.0
524 Front #3	34	Cd-109	1,120 ± 91	Lab Sample
524 Front #3	34	Cd-109	894 ± 80	
524 Front #3	34	Cd-109	1,000 ± 93	Ave.= 1,004.7
524 Front #4	34	Cd-109	1,190 ± 94	

**Table 1(b) (continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (mg/kg):	Comments/Average Concentration:
524 Front #4	34	Cd-109	1,210 ± 90	
524 Front #4	34	Cd-109	1,300 ± 110	Ave. = 1,233.3
536 Martin	35	Cd-109	142 ± 39	(Actual address 536 Front)
536 Martin	35	Cd-109	183 ± 43	
536 Martin	35	Cd-109	155 ± 41	Ave. = 160.0
610 Front #1	33	Cd-109	1,080 ± 110	Lab Sample
610 Front #1	33	Cd-109	1,440 ± 110	
610 Front #1	34	Cd-109	1,270 ± 120	Ave. = 1,263.3
610 Front #2	34	Cd-109	773 ± 77	
610 Front #2	34	Cd-109	817 ± 78	
610 Front #2	34	Cd-109	1,030 ± 99	Ave. = 873.3
617 Front #1	33	Cd-109	2,700 ± 180	
617 Front #1	31	Cd-109	1,370 ± 140	
617 Front #1	33	Cd-109	1,890 ± 120	Ave. = 1,986.7
617 Front #2	34	Cd-109	2,840 ± 160	Lab Sample
617 Front #2	34	Cd-109	1,640 ± 110	
617 Front #2	34	Cd-109	1,520 ± 110	
617 Front #2	34	Cd-109	1,460 ± 110	Ave. = 2,486.7
617 Front #3	34	Cd-109	940 ± 86	
617 Front #3	34	Cd-109	1,050 ± 93	
617 Front #3	34	Cd-109	1,100 ± 93	Ave. = 1,030.0
617 Front #4	31	Cd-109	212 ± 44	
617 Front #4	31	Cd-109	646 ± 84	
617 Front #4	31	Cd-109	653 ± 72	
617 Front #4	31	Cd-109	735 ± 79	Ave. = 585.2
617 Front #4	31	Cd-109	680 ± 75	(Duplicate)
617 Front #5	34	Cd-109	1,690 ± 110	
617 Front #5	31	Cd-109	1,400 ± 110	Ave. = 1,395.0

**Table 1(b) (continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (mg/kg):	Comments/Average Concentration:
617 Front #5	34	Cd-109	1,320 ± 110	(Duplicate)
617 Front #6	34	Cd-109	1,650 ± 110	
617 Front #6	31	Cd-109	1,290 ± 100	
617 Front #6	31	Cd-109	1,450 ± 120	Ave.= 1,463.3
618 Front #1	33	Cd-109	3,670 ± 170	Lab Sample
618 Front #1	33	Cd-109	1,830 ± 96	
618 Front #1	34	Cd-109	2,690 ± 160	Ave.= 2,760.0
618 Front #2	33	Cd-109	2,190 ± 130	Lab Sample
618 Front #2	31	Cd-109	2,200 ± 190	
618 Front #2	34	Cd-109	2,440 ± 150	Ave.= 2,276.7
618 Front #3	31	Cd-109	123 ± 35	
618 Front #3	36	Cd-109	183 ± 40	
618 Front #3	31	Cd-109	127 ± 38	Ave.= 144.3
621 Front #1	31	Cd-109	646 ± 74	Lab Sample
621 Front #1	31	Cd-109	587 ± 73	
621 Front #1	34	Cd-109	678 ± 62	Ave.= 637.0
621 Front #2	31	Cd-109	96.1 ± 34	Lab Sample
621 Front #2	32	Cd-109	128 ± 37	
621 Front #2	37	Cd-109	187 ± 38	Ave.= 137.0
619 Martin #4	38	Cd-109	670 ± 57	Lab Sample
619 Martin #4	34	Cd-109	712 ± 65	
619 Martin #4	34	Cd-109	736 ± 65	Ave.= 706.0
619 Martin #5	34	Cd-109	1,240 ± 86	
619 Martin #5	34	Cd-109	1,350 ± 94	
619 Martin #5	34	Cd-109	1,230 ± 90	Ave.= 1,273.3
620 Martin	34	Cd-109	188 ± 43	Lab Sample
620 Martin	35	Cd-109	97.2 ± 38	
620 Martin	34	Cd-109	128 ± 38	Ave.= 137.7

**Table 1(b) (continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (mg/kg):	Comments/Average Concentration:
Page #1	34	Cd-109	610 ± 63	Lab Sample
Page #1	31	Cd-109	484 ± 65	
Page #1	34	Cd-109	602 ± 67	Ave.= 565.3
Page #2	35	Cd-109	316 ± 50	
Page #2	31	Cd-109	562 ± 73	
Page #2	31	Cd-109	479 ± 67	Ave.= 452.3
Page #3	34	Cd-109	714 ± 70	
Page #3	30	Cd-109	461 ± 56	
Page #3	34	Cd-109	442 ± 49	Ave.= 508.3
Page #3	40	Cd-109	416 ± 42	(Duplicate)
Page #4	34	Cd-109	460 ± 53	Lab Sample
Page #4	31	Cd-109	523 ± 64	
Page #4	35	Cd-109	482 ± 54	Ave.= 488.3
Page #5	34	Cd-109	556 ± 56	
Page #5	31	Cd-109	493 ± 54	
Page #5	31	Cd-109	656 ± 68	Ave.=580.8
Page #5	34	Cd-109	618 ± 62	(Duplicate)
Page #6	34	Cd-109	630 ± 59	
Page #6	34	Cd-109	576 ± 59	
Page #6	37	Cd-109	737 ± 65	Ave.= 647.7
Page # 7	34	Cd-109	800 ± 78	
Page # 7	34	Cd-109	864 ± 80	
Page # 7	34	Cd-109	740 ± 74	Ave.= 790.3
Page # 7	34	Cd-109	757 ± 71	(Duplicate)
Martin Alley #1	35	Cd-109	735 ± 84	
Martin Alley #1	34	Cd-109	764 ± 74	
Martin Alley #1	35	Cd-109	676 ± 95	Ave.= 725.0
Martin Alley #2	34	Cd-109	1,480 ± 110	Lab Sample

**Table 1(b) (continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (mg/kg):	Comments/Average Concentration:
Martin Alley #2	33	Cd-109	2,270 ± 140	
Martin Alley #2	35	Cd-109	1,190 ± 130	Ave.= 1,646.7
Martin Alley #3	37	Cd-109	1,590 ± 110	
Martin Alley #3	33	Cd-109	1,720 ± 120	
Martin Alley #3	33	Cd-109	1,650 ± 130	Ave.= 1,653.3
School S. Alley	32	Cd-109	577 ± 82	
School S. Alley	35	Cd-109	383 ± 70	
School S. Alley	35	Cd-109	396 ± 72	Ave.= 452.0
Coyle #1	38	Cd-109	415 ± 54	
Coyle #1	34	Cd-109	454 ± 61	
Coyle #1	38	Cd-109	362 ± 53	Ave.= 410.3
Coyle #2	31	Cd-109	350 ± 73	
Coyle #2	40	Cd-109	431 ± 61	
Coyle #2	34	Cd-109	332 ± 66	Ave.= 371.0
Coyle #3	31	Cd-109	169 ± 41	
Coyle #3	42	Cd-109	212 ± 39	
Coyle #3	31	Cd-109	139 ± 38	Ave.= 172.3
W Martin #1	34	Cd-109	431 ± 53	
W Martin #1	35	Cd-109	275 ± 46	
W Martin #1	34	Cd-109	524 ± 53	Ave.= 410.0
W. Martin #2	35	Cd-109	410 ± 61	
W. Martin #2	35	Cd-109	386 ± 68	
W. Martin #2	34	Cd-109	493 ± 30	Ave.= 587.7
W. Martin #2	34	Cd-109	474 ± 40	(Duplicate)
W Martin #3	30	Cd-109	843 ± 88	
W Martin #3	34	Cd-109	969 ± 87	
W Martin #3	34	Cd-109	816 ± 140	Ave.= 876.0
Martin #1	33	Cd-109	887 ± 84	

**Table 1(b) (continued)**

Sample I.D.:	Run Time (Ss):	Source:	Lead (mg/kg):	Comments/Average Concentration:
Martin #1	33	Cd-109	986 ± 99	
Martin #1	34	Cd-109	795 ± 81	Ave.= <b>889.3</b>
Martin #2	33	Cd-109	938 ± 94	
Martin #2	33	Cd-109	1,370 ± 120	
Martin #2	35	Cd-109	800 ± 90	Ave.= <b>1,036.0</b>
Martin RROW W School #1	34	Cd-109	105 ± 36	
Martin RROW W School #1	31	Cd-109	153 ± 51	
Martin RROW W School #1	38	Cd-109	62.1 ± 34	Ave.= 106.7
Martin RROW West School	34	Cd-109	268 ± 57	
Martin RROW West School	34	Cd-109	303 ± 55	
Martin RROW West School	34	Cd-109	247 ± 47	Ave.= 363.7
Martin RROW West School	41	Cd-109	273 ± 44	(Duplicate)
Front RROW East School #3	35	Cd-109	94 ± 35	
Front RROW East School #3	34	Cd-109	204 ± 41	
Front RROW East School #3	31	Cd-109	117 ± 35	Ave.= 138.3

Notes: All analyses conducted February and March, 2001. Results in milligrams per kilogram (mg/kg). Results in **bold** indicate levels greater than the KDHE RSK residential lead soil standard of 400 mg/kg. All analyses conducted according to EPA Method 6200 on wet samples (not oven-dried) with imprecision indicated as ± in mg/kg. Samples collected 0-6" depth. Average concentration calculated with simple three (3)-point average.

**Table 2(a)**  
**Laboratory Results for Background Soil Samples**

Sample I.D.:	Lead (mg/kg):	Arsenic (mg/kg):	Cadmium (mg/kg):	Chromium (mg/kg):	Mercury (mg/kg):
SB-1	209.03	6.36	5.4	13.08	0.0426
SB-2	38.3	8.0	0.6	19.4	ND(0.1)
SB-3	15.7	5.7	0.6	13.5	ND(0.1)
SB-4	28.1	6.8	0.3	17.7	ND(0.1)
<b>3X Max. Value (3XMAX)</b>	<b>627.1</b>	<b>24.0</b>	<b>16.2</b>	<b>58.2</b>	<b>0.3</b>
3X Mean	130.1	20.0	2.6	47.1	0.1

Note: All samples obtained 03/01. **Red** indicates levels in excess of residential RSK levels. **Magenta** indicates results in excess of 3XMAX background concentration but not in excess of RSK levels. The **bold red** levels indicate constituent levels in excess of residential RSKs **and** 3XMAX concentration.

Analysis conducted by EPA Method 6010 (except mercury) and EPA Method 7471 (mercury) by Division of Health and Environment Laboratories (DHEL), Topeka, Kansas; Heritage Environmental Services, Indianapolis, Indiana; and Pace Analytical Services, Lenexa, Kansas.  
ND: Not Detected

**Table 2(b)**  
**Laboratory Results for Confirmatory Samples**

Sample I.D.:	Lead (mg/kg):	Arsenic (mg/kg):	Cadmium (mg/kg):	Chromium (mg/kg):	Mercury (mg/kg):
620 Martin	142	13.1	3.0	25.1	ND(0.1)
Page #1	562.0	21.1	18.8	17.5	0.3
Page #4	489.0	14.5	17.7	16.3	0.3
520 Front #3	805.0	18.5	25.0	18.6	0.4
Martin Alley #2	2,090.0	31.4	40.8	21.1	-
619 Martin #4	843.0	11.8	25.8	14.1	-
619 Martin #5	1,750.0	16.0	180.0	31.8	0.7
Front RROW #3	65.0	7.4	1.6	22.9	ND(0.1)
524 Front #4	1,450.0	15.2	26.2	17.5	0.4
618 Front #2	3,680.0	33.7	55.8	19.3	0.8
617 Front #2	1,660.0	21.8	32.8	15.9	0.8
621 Front #2	152	6.6	5.4	21.7	ND(0.1)
618 Front #1	3,190.0	31.3	41.0	18.1	0.7
513 Front #3	1,110.0	12.4	28.4	17.0	0.5
509 Front #4	1,710.0	17.9	32.3	29.0	0.6
513 Front #2	85.0	6.4	3.4	17.4	ND(0.1)
509 Front #3	227.0	7.6	5.9	19.9	0.1
610 Front #1	1,540.0	26.8	121.0	15.3	1.0
621 Front #1	764.0	12.1	23.3	16.6	0.2

Note: All samples obtained 03/01. **Red** indicates levels in excess of residential RSK levels. **Magenta** indicates results in excess of 3XMAX background concentration but not in excess of RSK levels. The **bold red** levels indicate constituent levels in excess of residential RSKs **and** 3XMAX concentration.

Analysis conducted by EPA Method 6010 (except mercury) and EPA Method 7471 (mercury) by Division of Health and Environment Laboratories (DHEL), Topeka, Kansas; Heritage Environmental Services, Indianapolis, Indiana; and Pace Analytical Services, Lenexa, Kansas.

ND: Not Detected

**Table 3**  
**Summary of Toxicity Characteristic Leachate Procedure (TCLP)**  
**Laboratory Results for Soil Samples**

Sample I.D.:	Total Lead (mg/kg)	TCLP Lead (mg/l)
Page # 4	489	0.14
Martin Alley #2	2,090	1.92
619 Martin #4	843	0.36
619 Martin #5	1,750	0.69
618 Front #2	3,680	2.21
618 Front #1	3,190	2.12
513 Front #3	1,110	0.34
610 Front #1	1,540	4.97

Note: All samples obtained 08-09/00. **Violat** indicates waste profile Toxicity Characteristic Leachate Procedure (TCLP) results in excess of criteria established in § 261.24 of the Resource Conservation and Recovery Act (RCRA). Analysis conducted by EPA Method 6010 (except mercury), EPA Method 7471 (mercury) and EPA Method 1311 (TCLP) by Heritage Environmental Services, Indianapolis, Indiana.  
 ND: Not Detected

**Table 4**  
**Comparison of XRF and Laboratory Data**

Sample ID:	Lead by XRF Analysis wet (undried) samples (mg/kg):	Lead by XRF Analysis dried samples (mg/kg):	Lead by EPA Method 6010 (mg/kg):
620 Martin	83.4	137.7	142
Page 1	453.7	565.3	562
Page 4	449.7	488.3	489
520 Front #3	527.3	996.0	805
Martin Alley #2	1,127.5	1,646.7	2,090
619 Martin #4	634.7	706.0	843
619 Martin #5	1,003.7	1,273.3	1,750
Front RROW #3	114.3	138.3	65.0
524 Front #4	750.0	1,233.3	1,450
618 Front #2	1,803.7	2,276.7	3,680
617 Front #2	807.3	2,486.7	1,660
621 Front #2	105.1	137.0	152
618 Front #1	1,916.7	2,760.0	3,190
513 Front #3	624.0	832.7	1,110
509 Front #4	NA	1,410.0	1,710
513 Front #2	79.7	89.7	85.0
509 Front #3	NA	263.0	227
610 Front #1	845.0	1,263.3	1,540
621 Front #1	405.3	637.0	764
<b>Wet Sample (Undried) Lead Linear Regression Parameters:</b>			
$r^2 = 0.971$	Degrees of Freedom = 16	Number of Observations = 18	
Constant = 87.746	Standard Error of Y Estimate = 94.733	Slope (X Coefficient)= 0.507	
<b>Dried Sample Lead Linear Regression Parameters:</b>			
$r^2 = 0.924$	Degrees of Freedom = 17	Number of Observations = 19	
Constant = 142.203	Standard Error of Y Estimate = 217.063	Slope (X Coefficient)= 0.718	

**Table 5(a)**  
**XRF Quality Control (QC) Parameters Summary/NIST Standards**

NIST Standard	Date:	XRF Lead (mg/kg):	NIST Standard Value:	Percent Difference (%PD):
High	3/05/01	5,090	5,532	7.99
High	3/05/01	5,010	5,532	9.44
High	3/06/01	5,030	5,532	9.07
High	3/06/01	5,020	5,532	9.26
High	3/06/01	4,860	5,532	12.15
High	3/06/01	5,050	5,532	8.71
High	3/27/01	5,010	5,532	9.44
High	3/27/01	5,040	5,532	8.89
High	3/27/01	5,140	5,532	7.09
High	3/15/01	5,190	5,532	6.18
High	3/15/01	5,120	5,532	7.45
High	3/15/01	5,180	5,532	6.36
Medium	3/06/01	1,050	1,162	9.64
Medium	3/06/01	1,020	1,162	12.22
Medium	3/06/01	1,020	1,162	12.22
Medium	3/06/01	1,000	1,162	13.94
Medium	3/07/01	1,050	1,162	9.64
Medium	3/07/01	1,020	1,162	12.22
Medium	3/16/01	1,030	1,162	11.36
Medium	3/16/01	1,020	1,162	12.22
Medium	3/08/01	1,060	1,162	8.78
Medium	3/08/01	996	1,162	14.29
<b>Average PD = % 9.29</b>				

Notes: All samples collected 03/01 by KDHE/BER/Site Assessment Unit. XRF: X-Ray Fluorescence. Analytical methods referenced to EPA Method SW-846, *Methods for Analysis of Solid Waste*. Percent difference for standards calculated by  $((C_s - C_k) / C_k) \times 100$  where  $C_k$  = certified National Institute of Standards and Testing (NIST) lead concentration value of medium standard,  $1,162 \pm 31$  mg/kg; concentration of high standard,  $5,532$  mg/kg  $\pm 100$  mg/kg;  $C_s$  = measured in-field XRF lead concentration of standard. RSD calculated by  $RSD = (SD / \text{Mean Concentration}) \times 100$  where SD = standard deviation of the concentration for the analyte and Mean Concentration = mean concentration for the analyte

**Table 5(b): Relative Standard Deviation Results  
for XRF Field Duplicate Values**

Sample ID:	First Value: (mg/kg):	Second Value: (mg/kg):	Standard Deviation:	Relative Standard Deviation (RSD):
<b>Undried Samples:</b>				
520 Front #5	1,090	994	48	4.61
Martin Alley #2	1,070	1,040	15	1.42
Coyle #1	249	233	8	3.32
W. Martin #2	430	468	19	4.23
Martin RROW W. School	189	198	4.5	2.33
Medium Standard	1,020	1,020	0	0
High Standard	5,030	5,020	5	0.10
<b>Dried Samples:</b>				
520 Front #3	1050	1090	20	1.87
617 Front #4	735	680	27.5	3.89
617 Front #5	1400	1320	40	2.94
Page #3	442	416	13	3.03
Page #5	656	618	19	2.98
Page #7	740	757	8.5	1.14
W. Martin #2	493	474	9.5	1.96
Martin RROW W. School	247	273	13	5.0
<b>Average RSD = 2.59</b>				

Notes: All samples collected 03/01 by KDHE/BER/Site Assessment Unit. XRF: X-Ray Fluorescence Data Source: KDHE, 2001. Analytical methods referenced to EPA Method SW-846, Methods for Analysis of Solid Waste. Percent difference for standards calculated by  $((C_s - C_k) / C_k) \times 100$  where  $C_k$  = certified National Institute of Standards and Testing (NIST) lead concentration value of medium standard,  $1,162 \pm 31$  mg/kg; concentration of high standard,  $5,532$  mg/kg  $\pm 100$  mg/kg;  $C_s$  = measured in-field XRF lead concentration of standard. RSD calculated by  $RSD = (SD / \text{Mean Concentration}) \times 100$  where SD = standard deviation of the concentration for the analyte and Mean Concentration = mean concentration for the analyte.

**No QC parameters (% PD or RSD) were exceeded consistent with EPA Method 6200 criteria (% PD > 20 or average RSD > 20).**

ATTACHMENT B

PHOTOGRAPHIC DOCUMENTATION

Photo #1 - Cherryvale Residential Yards RSE Site



Date: 3/01

View: Southwest

Photographer: Randolph L. Brown

Comments: Overview of the residential area. The intersection of Martin and Coyle Streets is in the foreground.

Photo #2 - Cherryvale Residential Yards RSE Site



Date: 3/01

View: East

Photographer: Randolph L. Brown

Comments: Photo shows the residence at 511 Martin.

Photo #3 - Cherryvale Residential Yards RSE Site



Date: 3/01  
View: East  
Photographer: Randolph L. Brown  
Comments: 619 Martin residence in the foreground, other residences in background.

Photo #4 - Cherryvale Residential Yards RSE Site



Date: 3/01  
View: East  
Photographer: Randolph L. Brown  
Comments: Looking east on Front Street. 621 and 617 Front Street residences to the right.

Photo #5 - Cherryvale Residential Yards RSE Site



Date: 3/01

View: East

Photographer: Randolph L. Brown

Comments: Residence in foreground is vacant. 620, 618 and 610 Front Street in background.

Photo #6 - Cherryvale Residential Yards RSE Site



Date: 3/01

View: East

Photographer: Randolph L. Brown

Comments: 536, 524 and 520 Front Street residences.

Photo #7- Cherryvale Residential Yards RSE Site



Date: 3/01

View: East

Photographer: Randolph L. Brown

Comments: 513 and 509 Front Street residences.

**ATTACHMENT C**

**ANALYTICAL DATA**



**DIVISION OF HEALTH & 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  
Forbes Field, Bldg. 740  
Attn: Randy Brown  
Topeka KS 66620

Lab Number: 101283PT

4EM80

Site ID:  
Account Code: EP

Collection Location: C306300026 Nat. Zinc SB-1

Collector: Randy Brown-BER  
Date/Time Collected: 02/19/01 14:15

Matrix: Soil

Collect Depth:  
Date/Time Received: 02/21/01 17:00

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	11840.71	mg/Kg	02/28/01	EPA 6010
Antimony (Total)	< 5.00	mg/Kg	02/28/01	EPA 6010
Arsenic (Total)	6.36	mg/Kg	02/28/01	EPA 6010
Barium (Total)	127.33	mg/Kg	02/28/01	EPA 6010
Beryllium (Total)	0.47	mg/Kg	02/28/01	EPA 6010
Boron (Total)	< 1.00	mg/Kg	02/28/01	EPA 6010
Cadmium (Total)	5.40	mg/Kg	02/28/01	EPA 6010
Calcium (Total)	3332.98	mg/Kg	02/28/01	EPA 6010
Chromium (Total)	13.08	mg/Kg	02/28/01	EPA 6010
Cobalt (Total)	4.21	mg/Kg	02/28/01	EPA 6010
Copper (Total)	31.70	mg/Kg	02/28/01	EPA 6010
Iron (Total)	11767.78	mg/Kg	02/28/01	EPA 6010
Lead (Total)	209.03	mg/Kg	02/28/01	EPA 6010
Magnesium (Total)	1226.63	mg/Kg	02/28/01	EPA 6010
Manganese (Total)	397.90	mg/Kg	02/28/01	EPA 6010
Mercury	0.0426	mg/Kg	02/27/01	EPA 245.2
Molybdenum (Total)	< 2.00	mg/Kg	02/28/01	EPA 6210
Nickel (Total)	8.58	mg/Kg	02/28/01	EPA 6210
Potassium (Total)	1933.64	mg/Kg	02/28/01	EPA 6210
Selenium (Total)	< 5.00	mg/Kg	02/28/01	EPA 6210
Silica (Total)	137.93	mg/Kg	02/28/01	EPA 6210
Silver (Total)	< 1.00	mg/Kg	02/28/01	EPA 6210
Sodium (Total)	133.89	mg/Kg	02/28/01	EPA 6210
Thallium (Total)	< 5.00	mg/Kg	02/28/01	EPA 6210
Vanadium (Total)	23.18	mg/Kg	02/28/01	EPA 6210
Zinc (Total)	675.78	mg/Kg	02/28/01	EPA 6210

Reporting Analyst: REH  
Date Reported: 03/05/01

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

Copies To: File

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**Environmental Laboratories**  
Inorganic Chemistry (785) 296-1657  
Organic Chemistry (785) 296-1647  
Radiochemistry (785) 296-1629  
Env. Microbiology (785) 296-0971

Roger H. Carlson, Ph.D., Director - (785) 296-1620  
Laboratory Information and Reporting - (785) 296-1627  
Laboratory Fax - (785) 296-1641

**Health Laboratories**  
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Neonatal Screening (785) 296-1651  
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03/29/2001

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Kansas Dept. of Health & Environment  
Attn: Randy Brown  
740 Forbes Field  
Topeka, KS 66620-0001

Date Received: 03/16/2001  
Continental File No.: 5962  
Continental Order No.: 69509  
Project No.:  
Your P.O.: 33322

Dear Mr. Brown:

This laboratory report consisting of 11 pages contains the analytical results for the following samples:

<u>CAS LAB ID #</u>	<u>SAMPLE DESCRIPTION</u>	<u>SAMPLE TYPE</u>	<u>DATE SAMPLED</u>
01031195	620 Martin	Solid	03/05/2001
01031196	Page 1	Solid	03/05/2001
01031197	Page 4	Solid	03/05/2001
01031198	520 Front #3	Solid	03/05/2001
01031199	Martin Alley #2	Solid	03/05/2001
01031200	SB-4	Solid	03/13/2001
01031201	SB-2	Solid	03/13/2001
01031202	SB-3	Solid	03/13/2001
01031203	614 Martin #4	Solid	03/05/2001
01031204	619 Martin #5	Solid	03/05/2001
01031205	Front Rrow #3	Solid	03/05/2001
01031206	524 Front #4	Solid	03/05/2001

The footnotes contained in the attached laboratory reports are summarized below for your reference.

<u>CAS LAB ID #</u>	<u>TEST NAME</u>	<u>SAMPLE CONC.</u>
01031202	Cadmium, Total.	ND(0.6) M

M - Reporting limit higher than normal due to matrix interferences.





03/29/2001

Thank you for choosing Continental for this project. If you have any questions, please contact me at (800)-535-3076.

CONTINENTAL ANALYTICAL SERVICES, INC.

A handwritten signature in cursive script, appearing to read "Gregory J. Groene".

Gregory J. Groene  
Project Manager

Page 2

1804 GLENDALE ROAD • SALINA, KANSAS 67401-6675  
785-827-1273 • 800-535-3076 • FAX 785-823-7830



# Continental

Analytical Services, Inc.

Page: 3

Client: Kansas Dept. of Health & Environment  
 Attn: Randy Brown  
 740 Forbes Field  
 Topeka, KS 66620-0001

Date Sample Rptd: 03/29/2001  
 Date Sample Recd: 03/16/2001  
 Continental File No: 5962  
 Continental Order No: 69509  
 Client P.O.:

Lab Number: 01031195  
 Sample Description: 620 Martin

Date Sampled: 03/05/2001  
 Time Sampled: 1600

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	13.1	mg/kg	03/21/2001	4866/5
Barium, Total	220.	mg/kg	03/21/2001	4866/5
Cadmium, Total	3.0	mg/kg	03/21/2001	4866/5
Chromium, Total	25.1	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	142.	mg/kg	03/21/2001	4866/4
Mercury, Total Soil	ND(0.1)	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	ND(1.0)	mg/kg	03/21/2001	4866/5
Silver, Total	1.5	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031195

Lab Number: 01031196  
 Sample Description: Page 1

Date Sampled: 03/05/2001  
 Time Sampled: 1130

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	21.1	mg/kg	03/21/2001	4866/5
Barium, Total	180.	mg/kg	03/21/2001	4866/5
Cadmium, Total	18.8	mg/kg	03/21/2001	4866/5
Chromium, Total	17.5	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	562.	mg/kg	03/21/2001	4866/5
Mercury, Total Soil	0.3	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	1.7	mg/kg	03/21/2001	4866/5
Silver, Total	2.2	mg/kg	03/21/2001	4866/5

-Continued-

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 ENVIRONMENTAL REMEDIATION



## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 4

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031196  
 Sample Description: Page 1

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031196

Lab Number: 01031197  
 Sample Description: Page 4

Date Sampled: 03/05/2001  
 Time Sampled: 1145

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	0.14	mg/L	03/23/2001	4866/8
Arsenic, Total (ICP)	14.5	mg/kg	03/21/2001	4866/5
Barium, Total	180.	mg/kg	03/21/2001	4866/5
Cadmium, Total	17.7	mg/kg	03/21/2001	4866/5
Chromium, Total	16.3	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	489.	mg/kg	03/21/2001	4866/5
Mercury, Total Soil	0.3	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	1.4	mg/kg	03/21/2001	4866/5
Silver, Total	1.3	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Lead, TCLP	03/23/2001	010323-1	MAG	6010B
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B

-Continued-

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 Continental Analytical Services, Inc.

CONTINENTAL ANALYTICAL SERVICES, INC.

LABORATORY REPORT

Page: 5

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031197

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Silver, Total	03/19/2001	010319-4	MAG	6010B
TCLP Prep	03/20/2001	010320-1	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031197

Lab Number: 01031198  
 Sample Description: 520 Front #3

Date Sampled: 03/05/2001  
 Time Sampled: 1500

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	18.5	mg/kg	03/21/2001	4866/5
Barium, Total	200.	mg/kg	03/21/2001	4866/5
Cadmium, Total	25.0	mg/kg	03/21/2001	4866/5
Chromium, Total	18.6	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	805.	mg/kg	03/21/2001	4866/5
Mercury, Total Soil	0.4	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	1.5	mg/kg	03/21/2001	4866/5
Silver, Total	1.5	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031198

-Continued-

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LABORATORY REPORT

Page: 6

Client: Kansas Dept. of Health & Environment

Lab Number: 01031199

Date Sampled: 03/05/2001

Sample Description: Martin Alley #2

Time Sampled: 1430

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	1.92	mg/L	03/23/2001	4866/8
Arsenic, Total (ICP)	31.4	mg/kg	03/21/2001	4866/5
Barium, Total	190.	mg/kg	03/21/2001	4866/5
Cadmium, Total	40.8	mg/kg	03/21/2001	4866/5
Chromium, Total	21.1	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	2090.	mg/kg	03/22/2001	4866/6
Selenium, Total (ICP)	2.4	mg/kg	03/21/2001	4866/5
Silver, Total	4.2	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Lead, TCLP	03/23/2001	010323-1	MAG	6010B
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
TCLP Prep	03/20/2001	010320-1	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031199

Lab Number: 01031200  
Sample Description: SB-4

Date Sampled: 03/13/2001  
Time Sampled: 1145

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	6.8	mg/kg	03/21/2001	4866/5
Barium, Total	110.	mg/kg	03/21/2001	4866/5
Cadmium, Total	ND(0.3)	mg/kg	03/21/2001	4866/5
Chromium, Total	17.7	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	28.1	mg/kg	03/21/2001	4866/4
Mercury, Total Soil	ND(0.1)	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	ND(1.0)	mg/kg	03/21/2001	4866/5
Silver, Total	ND(1.0)	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B

-Continued-

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## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 7

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031200

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031200

Lab Number: 01031201  
 Sample Description: SB-2

Date Sampled: 03/13/2001  
 Time Sampled: 1130

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	8.0	mg/kg	03/21/2001	4866/5
Barium, Total	180.	mg/kg	03/21/2001	4866/5
Cadmium, Total	0.6	mg/kg	03/21/2001	4866/5
Chromium, Total	19.4	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	38.3	mg/kg	03/21/2001	4866/4
Mercury, Total Soil	ND(0.1)	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	ND(1.0)	mg/kg	03/21/2001	4866/5
Silver, Total	ND(1.0)	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031201

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## LABORATORY REPORT

Page: 8

Client: Kansas Dept. of Health &amp; Environment

Lab Number: 01031202  
Sample Description: SB-3Date Sampled: 03/13/2001  
Time Sampled: 1135

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	5.7	mg/kg	03/21/2001	4866/5
Barium, Total	100.	mg/kg	03/21/2001	4866/5
Cadmium, Total	ND(0.6) M	mg/kg	03/21/2001	4866/5
Chromium, Total	13.5	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	15.7	mg/kg	03/21/2001	4866/4
Mercury, Total Soil	ND(0.1)	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	ND(1.0)	mg/kg	03/21/2001	4866/5
Silver, Total	ND(1.0)	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

M - Reporting limit higher than normal due to matrix interferences.

Conclusion of Lab Number: 01031202

Lab Number: 01031203  
Sample Description: 614 Martin #4Date Sampled: 03/05/2001  
Time Sampled: 1650

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	0.36	mg/L	03/23/2001	4866/8
Arsenic, Total (ICP)	11.8	mg/kg	03/21/2001	4866/5
Barium, Total	120.	mg/kg	03/21/2001	4866/5
Cadmium, Total	25.8	mg/kg	03/21/2001	4866/5
Chromium, Total	14.1	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	843.	mg/kg	03/21/2001	4866/5
Selenium, Total (ICP)	1.0	mg/kg	03/22/2001	4866/6
Silver, Total	ND(1.0)	mg/kg	03/21/2001	4866/5

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## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 9

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031203  
 Sample Description: 614 Martin #4

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
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<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Lead, TCLP	03/23/2001	010323-1	MAG	6010B
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
TCLP Prep	03/20/2001	010320-1	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031203

Lab Number: 01031204  
 Sample Description: 619 Martin #5

Date Sampled: 03/05/2001  
 Time Sampled: 1655

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	0.69	mg/L	03/23/2001	4866/8
Arsenic, Total (ICP)	16.0	mg/kg	03/21/2001	4866/5
Barium, Total	180.	mg/kg	03/21/2001	4866/5
Cadmium, Total	31.8	mg/kg	03/21/2001	4866/5
Chromium, Total	16.2	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	1750.	mg/kg	03/22/2001	4866/6
Mercury, Total Soil	0.7	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	2.0	mg/kg	03/21/2001	4866/5
Silver, Total	1.3	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Lead, TCLP	03/23/2001	010323-1	MAG	6010B
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A

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## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 10

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031204

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
TCLP Prep	03/20/2001	010320-1	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031204

Lab Number: 01031205  
 Sample Description: Front Row #3

Date Sampled: 03/05/2001  
 Time Sampled: 1700

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	7.4	mg/kg	03/21/2001	4866/5
Barium, Total	160.	mg/kg	03/21/2001	4866/5
Cadmium, Total	1.6	mg/kg	03/21/2001	4866/5
Chromium, Total	22.9	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	65.0	mg/kg	03/21/2001	4866/4
Mercury, Total Soil	ND(0.1)	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	ND(1.0)	mg/kg	03/21/2001	4866/5
Silver, Total	ND(1.0)	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031205

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-Continued-

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LABORATORY REPORT

Page: 11

Client: Kansas Dept. of Health & Environment

Lab Number: 01031206

Date Sampled: 03/05/2001

Sample Description: 524 Front #4

Time Sampled: 1340

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	15.2	mg/kg	03/21/2001	4866/5
Barium, Total	180.	mg/kg	03/21/2001	4866/5
Cadmium, Total	26.2	mg/kg	03/21/2001	4866/5
Chromium, Total	17.5	mg/kg	03/21/2001	4866/5
Lead, Total (ICP)	1450.	mg/kg	03/22/2001	4866/6
Mercury, Total Soil	0.4	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	1.4	mg/kg	03/21/2001	4866/5
Silver, Total	1.9	mg/kg	03/21/2001	4866/5

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Barium, Total	03/19/2001	010319-4	MAG	6010B
Cadmium, Total	03/19/2001	010319-4	MAG	6010B
Chromium, Total	03/19/2001	010319-4	MAG	6010B
Lead, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/19/2001	010319-4	MAG	6010B
Silver, Total	03/19/2001	010319-4	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031206

Laboratory analyses were performed on samples utilizing procedures published in Title 40 of the Code of Federal Regulations, Parts 136 or 141, or in EPA Publication, SW-846, 3rd edition, September, 1986 and the latest promulgated update. ND(), where noted, indicates none detected with the reporting limit in parentheses. Samples will be retained for thirty days unless otherwise notified.

CONTINENTAL ANALYTICAL SERVICES, INC.

*Clifford J. Baker*  
Clifford J. Baker  
Technical Manager

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ENVIRONMENTAL MEDIATION

 **Continental**  
Analytical Services, Inc.

**COOLER / SAMPLE RECEIPT FORM**

File No: 5962  
Order No: 109509

Client Name: KDHE  
Sample ID: S00C0C

Date/Time cooler arrived: 3/16/01 11:40 By: CRP  
Unpacked By: CRP Entered into LIMS by: CRP Date: 3/16/01

Cooler Identification: CAS Cooler #: \_\_\_\_\_ / Client's Cooler/Box/Letter/Hand Delivered  
Other: \_\_\_\_\_

Cooler Size: Small / Medium / Large / NA

Delivered By: UPS/FedX/AirBrn/Pny Exp/Field S/Mail/Walk-In/Other  
Air Bill Number: \_\_\_\_\_

Custody Seal: Present (Intact or Broken) Absent Seal No: \_\_\_\_\_  
Seal Name: \_\_\_\_\_ Seal Date: \_\_\_\_\_  
Seal matches Chain of Custody: Yes / No / NA

Type of Packing Material: Blue Ice/Ice/Bubble/Foam/Paper/Peanuts/Vermiculite/NA

Cooler Temperature (°C): 1 2 3 4 5 6 7 8 9 10 Accidentally not taken  
(Temperature includes correction factor.) Temp. By: Temp. Blank \_\_\_\_\_ Poured \_\_\_\_\_ Surface G P M  
Thermo. ID No.: \_\_\_\_\_ Thermo. Correction Factor (°C): \_\_\_\_\_

Sample Receipt Discrepancies:  No  Yes (See detail below)

- Chain of Custody not present
- Broken or Leaking Containers: \_\_\_\_\_
- Information obtained from: \_\_\_\_\_
- Sample listed on Chain of Custody, not received: \_\_\_\_\_
- Purchase Order/Letter received with samples
- Container label absent
- Sample description on container label different from Chain of Custody: \_\_\_\_\_
- Chain of Custody incomplete
- Chain of Custody missing time sampled
- Time sampled obtained from container label
- Chain of Custody missing date sampled
- Date sampled obtained from container label
- Sample excluded from Chain of Custody: \_\_\_\_\_
- Air bubbles in VOA vials: \_\_\_\_\_

Detailed Description/Comments: \_\_\_\_\_

Did Project Manager contact client regarding cooler/sample receipt conditions: Yes / No

Who was contacted: \_\_\_\_\_ Remarks: \_\_\_\_\_

Reviewed by Project Manager: MDM Date: 3/16/01





# Chain-of-Custody Record

# CAS

Continental Analytical Services, Inc.

1804 Glendale • Salina, KS 67401  
 (785) 827-1273 • (800) 535-3076  
 FAX (785) 823-7830

PROJECT # \_\_\_\_\_ PROJECT NAME \_\_\_\_\_

SAMPLED BY (SIGNATURE): \_\_\_\_\_ SAMPLED BY (PRINTED): \_\_\_\_\_

DATE	TIME	C-COMP G-GRAB	FIELD FILTERED Y N	SAMPLE IDENTIFICATION	# OF CONTAINERS	REMARKS (REQUESTED TURNAROUND, PRESERVATIVE, ETC.)
03/16/01	1700	6		FRONT ROW #3 0-6"	1	X
03/16/01	1340	6		524 Front #4 0-6"	1	X

Reps Metals 60144  
 SCLP Level 1311

~~NOT CLP~~

Need Results by  
 03/27/01

RELINQUISHED BY (SIGNATURE): Randolph Brown RELINQUISHED BY (PRINTED): Randolph Brown DATE: 03/16/01 TIME: 0430 RECEIVED BY (SIGNATURE): John Crigin RECEIVED BY (PRINTED): John Crigin DATE: 3/16/01 TIME: 0731

RELINQUISHED BY (SIGNATURE): John Crigin RELINQUISHED BY (PRINTED): John Crigin DATE: 3/16/01 TIME: 1140 RECEIVED BY (SIGNATURE): \_\_\_\_\_ RECEIVED BY (PRINTED): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RECEIVED AT LABORATORY BY (SIGNATURE/PRINTED): Melanie Rupert DATE: 3-16-01 TIME: 1140 SHIPPED VIA: \_\_\_\_\_ Seal #: \_\_\_\_\_ Airbill #: \_\_\_\_\_ Seal Date: \_\_\_\_\_

REPORT TO: Attention: \_\_\_\_\_ Address: \_\_\_\_\_ Phone #: \_\_\_\_\_ FAX #: \_\_\_\_\_

INVOICE TO: Attention: \_\_\_\_\_ Address: \_\_\_\_\_ Phone #: \_\_\_\_\_ FAX #: \_\_\_\_\_

Purchase Order No.: \_\_\_\_\_ CAS Price Quote No.: \_\_\_\_\_

# Continental

Analytical Services, Inc.

04/02/2001

Kansas Dept. of Health & Environment  
Attn: Randy Brown  
740 Forbes Field  
Topeka, KS 66620-0001

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Date Received: 03/27/2001  
Continental File No.: 5962  
Continental Order No.: 69714  
Project No.:  
Your P.O.: 33322

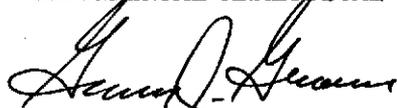
Dear Mr. Brown:

This laboratory report consisting of 9 pages contains the analytical results for the following samples:

<u>CAS LAB ID #</u>	<u>SAMPLE DESCRIPTION</u>	<u>SAMPLE TYPE</u>	<u>DATE SAMPLED</u>
01031970	618 Front #2	Solid	03/15/2001
01031971	617 Front #2	Solid	03/15/2001
01031972	621 Front #2	Solid	03/15/2001
01031973	618 Front #1	Solid	03/15/2001
01031974	513 Front #3	Solid	03/15/2001
01031975	509 Front #4	Solid	03/15/2001
01031976	513 Front #2	Solid	03/15/2001
01031977	509 Front #3	Solid	03/15/2001
01031978	610 Front #1	Solid	03/15/2001
01031979	621 Front #1	Solid	03/15/2001

Thank you for choosing Continental for this project. If you have any questions, please contact me at (800)-535-3076.

CONTINENTAL ANALYTICAL SERVICES, INC.



Gregory J. Groene  
Project Manager

Page 1

1804 GLENDALE ROAD • SALINA, KANSAS 67401-6675  
785-827-1273 • 800-535-3076 • FAX 785-823-7830  
KDHE Environmental Laboratory Accreditation No. E-10146





Page: 2

Client: Kansas Dept. of Health & Environment  
 Attn: Randy Brown  
 740 Forbes Field  
 Topeka, KS 66620-0001

Date Sample Rptd: 04/02/2001  
 Date Sample Recd: 03/27/2001  
 Continental File No: 5962  
 Continental Order No: 69714  
 Client P.O.:

Lab Number: 01031970  
 Sample Description: 618 Front #2

Date Sampled: 03/15/2001  
 Time Sampled: 1430

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	2.21	mg/L	03/30/2001	4866/13
Arsenic, Total (ICP)	33.7	mg/kg	03/29/2001	4866/13
Barium, Total	240.	mg/kg	03/29/2001	4866/13
Cadmium, Total	55.8	mg/kg	03/29/2001	4866/13
Chromium, Total	19.3	mg/kg	03/29/2001	4866/13
Lead, Total (ICP)	3680.	mg/kg	04/01/2001	4866/14
Mercury, Total Soil	0.8	mg/kg	03/29/2001	4425/331
Selenium, Total (ICP)	3.5	mg/kg	03/29/2001	4866/13
Silver, Total	4.4	mg/kg	03/29/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Lead, TCLP	03/29/2001	010329-5	MAG	6010B
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-1	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
TCLP Prep	03/28/2001	010328-1	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031970

Lab Number: 01031971  
 Sample Description: 617 Front #2

Date Sampled: 03/15/2001  
 Time Sampled: 1150

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	21.8	mg/kg	03/29/2001	4866/13
Barium, Total	250.	mg/kg	03/29/2001	4866/13
Cadmium, Total	32.8	mg/kg	03/29/2001	4866/13
Chromium, Total	15.9	mg/kg	03/29/2001	4866/13

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## LABORATORY REPORT

Page: 3

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031971  
 Sample Description: 617 Front #2

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, Total (ICP)	1660.	mg/kg	04/01/2001	4866/14
Mercury, Total Soil	0.8	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	2.2	mg/kg	03/29/2001	4866/13
Silver, Total	3.4	mg/kg	03/29/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031971

Lab Number: 01031972  
 Sample Description: 621 Front #2

Date Sampled: 03/15/2001  
 Time Sampled: 1300

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	6.6	mg/kg	03/29/2001	4866/13
Barium, Total	160.	mg/kg	03/29/2001	4866/13
Cadmium, Total	5.4	mg/kg	03/29/2001	4866/13
Chromium, Total	21.7	mg/kg	03/29/2001	4866/13
Lead, Total (ICP)	152.	mg/kg	03/29/2001	4866/13
Mercury, Total Soil	ND(0.1)	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	ND(1.0)	mg/kg	03/29/2001	4866/13
Silver, Total	ND(1.0)	mg/kg	03/29/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B

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## LABORATORY REPORT

Page: 4

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031972

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031972

Lab Number: 01031973  
 Sample Description: 618 Front #1

Date Sampled: 03/15/2001  
 Time Sampled: 1130

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	2.12	mg/L	03/30/2001	4866/13
Arsenic, Total (ICP)	31.3	mg/kg	03/29/2001	4866/13
Barium, Total	190.	mg/kg	03/29/2001	4866/13
Cadmium, Total	41.0	mg/kg	03/29/2001	4866/13
Chromium, Total	18.1	mg/kg	03/29/2001	4866/13
Lead, Total (ICP)	3190.	mg/kg	04/01/2001	4866/14
Mercury, Total Soil	0.7	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	4.1	mg/kg	03/29/2001	4866/13
Silver, Total	3.7	mg/kg	03/29/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Lead, TCLP	03/29/2001	010329-5	MAG	6010B
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
TCLP Prep	03/28/2001	010328-1	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031973

-Continued-

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## LABORATORY REPORT

Page: 5

Client: Kansas Dept. of Health &amp; Environment

Lab Number: 01031974  
Sample Description: 513 Front #3Date Sampled: 03/15/2001  
Time Sampled: 1145

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	0.34	mg/L	03/30/2001	4866/13
Arsenic, Total (ICP)	12.4	mg/kg	03/29/2001	4866/13
Barium, Total	200.	mg/kg	03/29/2001	4866/13
Cadmium, Total	28.4	mg/kg	03/29/2001	4866/13
Chromium, Total	17.0	mg/kg	03/29/2001	4866/13
Lead, Total (ICP)	1110.	mg/kg	04/01/2001	4866/14
Mercury, Total Soil	0.5	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	2.1	mg/kg	03/29/2001	4866/13
Silver, Total	1.6	mg/kg	03/29/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Lead, TCLP	03/29/2001	010329-5	MAG	6010B
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
TCLP Prep	03/28/2001	010328-1	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031974

Lab Number: 01031975  
Sample Description: 509 Front #4Date Sampled: 03/15/2001  
Time Sampled: 1310

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	17.9	mg/kg	03/29/2001	4866/13
Barium, Total	480.	mg/kg	03/29/2001	4866/13
Cadmium, Total	32.3	mg/kg	03/29/2001	4866/13
Chromium, Total	29.0	mg/kg	03/29/2001	4866/13
Lead, Total (ICP)	1710.	mg/kg	04/01/2001	4866/14
Mercury, Total Soil	0.6	mg/kg	03/31/2001	4425/332

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## LABORATORY REPORT

Page: 6

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031975  
 Sample Description: 509 Front #4

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Selenium, Total (ICP)	2.8	mg/kg	03/29/2001	4866/13
Silver, Total	2.2	mg/kg	03/29/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031975

Lab Number: 01031976  
 Sample Description: 513 Front #2

Date Sampled: 03/15/2001  
 Time Sampled: 1400

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	6.4	mg/kg	03/30/2001	4866/13
Barium, Total	110.	mg/kg	03/30/2001	4866/13
Cadmium, Total	3.4	mg/kg	03/30/2001	4866/13
Chromium, Total	17.4	mg/kg	03/30/2001	4866/13
Lead, Total (ICP)	85.0	mg/kg	03/30/2001	4866/13
Mercury, Total Soil	ND(0.1)	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	ND(1.0)	mg/kg	03/30/2001	4866/13
Silver, Total	ND(1.0)	mg/kg	03/30/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B

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LABORATORY REPORT

Page: 7

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031976

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Silver, Total	03/28/2001	010328-3	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031976

Lab Number: 01031977  
 Sample Description: 509 Front #3

Date Sampled: 03/15/2001  
 Time Sampled: 1330

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	7.6	mg/kg	03/30/2001	4866/13
Barium, Total	150.	mg/kg	03/30/2001	4866/13
Cadmium, Total	5.9	mg/kg	03/30/2001	4866/13
Chromium, Total	19.9	mg/kg	03/30/2001	4866/13
Lead, Total (ICP)	227.	mg/kg	03/30/2001	4866/13
Mercury, Total Soil	0.1	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	1.3	mg/kg	03/30/2001	4866/13
Silver, Total	ND(1.0)	mg/kg	03/30/2001	4866/13

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031977

Lab Number: 01031978  
 Sample Description: 610 Front #1

Date Sampled: 03/15/2001  
 Time Sampled: 1410

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Book/Page</u>
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## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 8

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031978  
 Sample Description: 610 Front #1

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date</u>	
			<u>Analyzed</u>	<u>Book/Page</u>
Lead, TCLP	4.97	mg/L	03/30/2001	4866/13
Arsenic, Total (ICP)	26.8	mg/kg	03/30/2001	4866/13
Barium, Total	160.	mg/kg	03/30/2001	4866/13
Cadmium, Total	121.	mg/kg	03/30/2001	4866/13
Chromium, Total	15.3	mg/kg	03/30/2001	4866/13
Lead, Total (ICP)	1540.	mg/kg	04/01/2001	4866/14
Mercury, Total Soil	1.0	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	4.1	mg/kg	03/30/2001	4866/13
Silver, Total	2.3	mg/kg	03/30/2001	4866/13

<u>Analysis</u>	<u>Date</u>		<u>Analyst</u>	<u>Method(s)</u>
	<u>Prepared</u>	<u>QC Batch</u>		
Lead, TCLP	03/29/2001	010329-6	MAG	6010B
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
TCLP Prep	03/28/2001	010328-2	KNH	1311
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A
ICP Metals TCLP Preparation Analyst/Method			SKR	3010A

Conclusion of Lab Number: 01031978

Lab Number: 01031979  
 Sample Description: 621 Front #1

Date Sampled: 03/15/2001  
 Time Sampled: 1350

<u>Analysis</u>	<u>Concentration</u>	<u>Units</u>	<u>Date</u>	
			<u>Analyzed</u>	<u>Book/Page</u>
Arsenic, Total (ICP)	12.1	mg/kg	03/30/2001	4866/13
Barium, Total	150.	mg/kg	03/30/2001	4866/13
Cadmium, Total	23.3	mg/kg	03/30/2001	4866/13
Chromium, Total	16.6	mg/kg	03/30/2001	4866/13
Lead, Total (ICP)	764.	mg/kg	03/30/2001	4866/13
Mercury, Total Soil	0.2	mg/kg	03/31/2001	4425/332
Selenium, Total (ICP)	1.4	mg/kg	03/30/2001	4866/13
Silver, Total	ND(1.0)	mg/kg	03/30/2001	4866/13

<u>Analysis</u>	<u>Date</u>		<u>Analyst</u>	<u>Method(s)</u>
	<u>Prepared</u>	<u>QC Batch</u>		
Arsenic, Total (ICP)	03/28/2001	010328-3	MAG	6010B

-Continued-

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 **Continental**  
 Analytical Services, Inc.

## CONTINENTAL ANALYTICAL SERVICES, INC.

## LABORATORY REPORT

Page: 9

Client: Kansas Dept. of Health & Environment  
 Lab Number: 01031979

<u>Analysis</u>	<u>Date Prepared</u>	<u>QC Batch</u>	<u>Analyst</u>	<u>Method(s)</u>
Barium, Total	03/28/2001	010328-3	MAG	6010B
Cadmium, Total	03/28/2001	010328-3	MAG	6010B
Chromium, Total	03/28/2001	010328-3	MAG	6010B
Lead, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Mercury, Total Soil	03/28/2001	010328-2	AMB	7471A
Selenium, Total (ICP)	03/28/2001	010328-3	MAG	6010B
Silver, Total	03/28/2001	010328-3	MAG	6010B
ICP Metals Total Preparation Analyst/Method			SKR	3050B
Mercury Total Preparation Analyst/Method			AMB	7471A

Conclusion of Lab Number: 01031979

Laboratory analyses were performed on samples utilizing procedures published in Title 40 of the Code of Federal Regulations, Parts 136 or 141, or in EPA Publication, SW-846, 3rd edition, September, 1986 and the latest promulgated update. ND(), where noted, indicates none detected with the reporting limit in parentheses. Samples will be retained for thirty days unless otherwise notified.

CONTINENTAL ANALYTICAL SERVICES, INC.

*Clifford J. Baker*  
 Clifford J. Baker  
 Technical Manager

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 APR 03 2001  
 BUREAU OF  
 ENVIRONMENTAL REMEDIATION

 **Continental**  
 Analytical Services, Inc.

**COOLER / SAMPLE RECEIPT FORM**

File No: 5962  
Order No: 69714

Client Name: KDHE  
Sample ID: See COC

Date/Time cooler arrived: 3/27/01 14:20 By: mam  
Unpacked By: mam Entered into LIMS by: CER Date: 3/27/01

Cooler Identification: CAS Cooler #: \_\_\_\_\_ Client's Cooler/Box/Letter/Hand Delivered  
Other: \_\_\_\_\_

Cooler Size: Small / Medium / Large / NA

Delivered By: UPS/FedX/AirBrrn/Pny Exp/Field S/Mail/Walk-In/Other \_\_\_\_\_  
Air Bill Number: \_\_\_\_\_

Custody Seal: Present (Intact or Broken) Absent Seal No: \_\_\_\_\_  
Seal Name: \_\_\_\_\_ Seal Date: \_\_\_\_\_  
Seal matches Chain of Custody: Yes / No / NA

Type of Packing Material: Blue Ice/Ice/Bubble/Foam/Paper/Peanuts/Vermiculite/ NA \_\_\_\_\_

Cooler Temperature (°C): 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ 7\_\_ 8\_\_ 9\_\_ 10\_\_ 22  
(Temperature includes Temp. By: Temp. Blank \_\_\_\_\_ Poured \_\_\_\_\_ Surface G P M  
correction factor.) Thermo. ID No.: 154 Thermo. Correction Factor (°C): 1

Sample Receipt Discrepancies:  No  Yes (See detail below)

- Chain of Custody not present
- Information obtained from: \_\_\_\_\_  
Purchase Order/Letter received with samples
- Container label absent
- Chain of Custody incomplete
  - Chain of Custody missing time sampled
    - Time sampled obtained from container label
  - Chain of Custody missing date sampled
    - Date sampled obtained from container label
- Sample excluded from Chain of Custody: \_\_\_\_\_
- Broken or Leaking Containers: \_\_\_\_\_
- Sample listed on Chain of Custody, not received: \_\_\_\_\_
- Sample description on container label different from Chain of Custody: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- Air bubbles in VOA vials: \_\_\_\_\_

Detailed Description/Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Did Project Manager contact client regarding cooler/sample receipt conditions: Yes  No

Who was contacted: \_\_\_\_\_ Remarks: \_\_\_\_\_

Reviewed by Project Manager: mam Date: 3/27/01



# Chain-of-Custody Record

# CAS

Continental Analytical Services, Inc.

1804 Glendale • Salina, KS 67401  
 (785) 827-1273 • (800) 535-3076  
 FAX (785) 823-7830

PROJECT # \_\_\_\_\_ PROJECT NAME Cherryvale Yards

SAMPLED BY (SIGNATURE): [Signature] SAMPLED BY (PRINTED): PETER HAXTON

DATE	TIME	C-COMP G-GRAB	FIELD FILTERED Y N	SAMPLE IDENTIFICATION	# OF CONTAINERS	ANALYTES				REMARKS (REQUESTED TURNAROUND, PRESERVATIVE, ETC.)
03/15/01	1420	6		618 Front #2 0-6"	1	✓	✓	✓		Analysis needs to be run by 3/30/01 CANA except TCLP on 621 Front #1
03/15/01	1150	6		617 Front #2 0-6"	1	✓	✓			
03/15/01	1300	6		621 Front #2 0-6"	1	0	✓			
03/15/01	1130	6		618 Front #1 0-6"	1	✓	✓	✓		
03/15/01	1145	6		513 Front #3 0-6"	1	✓	✓	✓		
03/15/01	1310	6		509 Front #4 0-6"	1	0	✓			
03/15/01	1400	6		513 Front #2 0-6"	1	✓	✓			
03/15/01	1330	6		509 Front #3 0-6"	1	✓	✓			
03/15/01	1410	6		610 Front #1 0-6"	1	✓	✓	✓		
03/15/01	1350	6		621 Front #1 0-6"	1	✓	✓	ⓧ	Hold for TCLP!	

RELINQUISHED BY (SIGNATURE): [Signature] RELINQUISHED BY (PRINTED): PETER HAXTON DATE: 3/27/01 TIME: 1420

RECEIVED BY (SIGNATURE): \_\_\_\_\_ RECEIVED BY (PRINTED): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RELINQUISHED BY (SIGNATURE): \_\_\_\_\_ RELINQUISHED BY (PRINTED): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RECEIVED BY (SIGNATURE): \_\_\_\_\_ RECEIVED BY (PRINTED): \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RECEIVED AT LABORATORY BY (SIGNATURE/PRINTED): Melisa McElwhee Melisa McElwhee DATE: 3/27/01 TIME: 1420

SHIPPED VIA: \_\_\_\_\_ Seal #: \_\_\_\_\_ Airbill #: \_\_\_\_\_ Seal Date: \_\_\_\_\_

REPORT TO: KDHE  
 Attention: RANDY BROWN  
 Address: FORBES FLO BLDG 740  
TOPEKA, KS 66620  
 Phone #: 785-296-8065 FAX #: \_\_\_\_\_

INVOICE TO: KDHE/BER  
 Attention: KATHY LEWIS  
 Address: SAME  
 Phone #: \_\_\_\_\_



**DIVISION OF HEALTH & ENVIRONMENTAL LABORATORIES**  
**Kansas Department of Health and Environment**  
**Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001**



**REPORT OF ANALYSIS**

**RECEIVED**  
 MAR 16 2001

**INORGANIC CHEMISTRY**

Report To: Bureau of Env. Remediation  
 Forbes Field, Bldg. 740  
 Attn: Randy Brown  
 Topeka KS 66620

Lab Number: 101310PT

Site ID: 4EM80

Account Code: EP

Collection Location: C306371097 Cherryvale Rinsate

Collector: Randy Brown-BER  
 Date/Time Collected: 03/06/01 14:30

Matrix: Water

Collect Depth:  
 Date/Time Received: 03/08/01 11:22

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method	
Aluminum	0.258	mg/L	03/14/01	EPA 200.7	
Antimony	<	0.050	mg/L	03/14/01	EPA 200.7
Arsenic	<	0.050	mg/L	03/14/01	EPA 200.7
Barium	<	0.005	mg/L	03/14/01	EPA 200.7
Beryllium	<	0.001	mg/L	03/14/01	EPA 200.7
Boron	<	0.010	mg/L	03/14/01	EPA 200.7
Cadmium	<	0.005	mg/L	03/14/01	EPA 200.7
Calcium	4.65	mg/L	03/14/01	EPA 200.7	
Chromium	<	0.010	mg/L	03/14/01	EPA 200.7
Cobalt	<	0.010	mg/L	03/14/01	EPA 200.7
Copper	<	0.010	mg/L	03/14/01	EPA 200.7
Iron	0.234	mg/L	03/14/01	EPA 200.7	
Lead	<	0.050	mg/L	03/14/01	EPA 200.7
Magnesium	0.13	mg/L	03/14/01	EPA 200.7	
Manganese	0.019	mg/L	03/14/01	EPA 200.7	
Mercury	<	0.0005	mg/L	03/09/01	EPA 245.2
Molybdenum	<	0.020	mg/L	03/14/01	EPA 200.7
Nickel	<	0.005	mg/L	03/14/01	EPA 200.7
Potassium	0.12	mg/L	03/14/01	EPA 200.7	
Selenium	<	0.050	mg/L	03/14/01	EPA 200.7
Silica	0.782	mg/L	03/14/01	EPA 200.7	
Silver	<	0.010	mg/L	03/14/01	EPA 200.7
Sodium	0.16	mg/L	03/14/01	EPA 200.7	
Thallium	<	0.050	mg/L	03/14/01	EPA 200.7
Vanadium	<	0.005	mg/L	03/14/01	EPA 200.7
Zinc	0.391	mg/L	03/14/01	EPA 200.7	

Reporting Analyst: REH  
 Date Reported: 03/16/01

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

Copies To: File

**Environmental Laboratories**  
 Inorganic Chemistry (785) 296-1657  
 Organic Chemistry (785) 296-1647  
 Radiochemistry (785) 296-1629  
 Env. Microbiology (785) 296-0971

Roger H. Carlson, Ph.D., Director - (785) 296-1620  
 Laboratory Information and Reporting - (785) 296-1627  
 Laboratory Fax - (785) 296-1641

**Health Laboratories**  
 Diagnostic Micro. (785) 296-1636  
 Neonatal Screening (785) 296-1651  
 Serology (785) 296-1653  
 Virology (785) 296-1645

**ATTACHMENT D**

**FIELD X-RAY FLUORESCENCE (XRF)  
ANALYTICAL FIELD SHEETS**

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/05/01 Site Name: Cherryvale Vails Operator Name: R Braun

System Check, Warm-Up and Internal Calibration Notes:

On 1620 Res 399 eV Ss Si  
3 x bag XRF analysis Wet samples (not dried)

Method 6200 Utilized? Y X N In-situ readings? Y N X bagged

If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Bags not dried, samples bagged in 1 qt Ziploc marked bags

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
Cal	538				Cal
High Std	539	Cd-109	62	5040 ± 160	
" "	540	Am-241	62		Cd < 73.0
Page 1	541	Am-241	62		Cd < 57.0 Samples collected
Page 1	542	Cd-109	62	333 ± 30	0-6"
Page 1	543	Cd-109	61	485 ± 37	
Page 1	544	Am-241	63		Cal < 47.0
Page 1	545	Am-241	62		Cd < 49.0
Page 1	546	Cd-109	61	543 ± 38.0	
Page 2	547	Cd-109	61	397 ± 31	Cd < 53.0
Page 2	548	Am-241	63		Cd < 53.0
Page 2	549	Am-241	62		Cd < 49.0
Page 2	550	Cd-109	61	446 ± 39	
Page 2	551	Cd-109		420 ± 42	
Page 2	552	Am-241			Cd < 51.0 Am-241 <u>Original</u>
Page 3	553	Cd-109	62	450 ± 38	
Page 3	554	Cd-109	62	615 ± 45	
Page 3	555	Cd-109	62	388 ± 38	



KDHE/Bureau of Environmental Remediation  
Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/06/01 <sup>AM</sup> Site Name: Cherryvale Residential Yards Site Operator Name: R.L. Brown

System Check, Warm-Up and Internal Calibration Notes:

On 1048 Cal 117 RCS 3.90 eV S<sub>25</sub> 5.50x.1  
Wet samples 3x bag analysis

Method 6200 Utilized? Y  N  In-situ readings? Y  N  bagged samples  
If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

bagged samples in marked 1 qt freezer bags

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.	
Mech Stg	564	cd-109	62	1000 ± 60		
Mech #1	565	cd-109	31	405 ± 46	All samples 0-611	
Mech #1	566	cd-109	31	505 ± 50		
Mech #1	567	cd-109	31	234 ± 47		
William #2	568	cd-109	31	430 ± 50		
William #2	569	cd-109	31	468 ± 49		Field Dip
William #7	570	cd-109	31	585 ± 69		
William #7	571	cd-109	31	373 ± 64		
William #3	572	cd-109	31	473 ± 56		
William #3	573	cd-109	34	823 ± 72		
William #3	574	cd-109	31	705 ± 67		
620 William #1	575	cd-109	31	504 ± 140		
620 William #2	576	cd-109	31	86.4 ± 27		
620 William #3	577	cd-109	31	113 ± 30		
Front RR 01	578	cd-109	31	107 ± 31		
Front RR 01	579	cd-109	31	28.1 ± 30		
Front RR 01	580	cd-109	31	87.2 ± 28		
Front RR 2	581	cd-109	32	179 ± 45		

KDHE/Bureau of Environmental Remediation  
Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/06/01 <sup>AM</sup> Site Name: Cherryvale Residential Yards Site Operator Name: R. Brennan

System Check, Warm-Up and Internal Calibration Notes:

On 1048 Cal 117 KCS 390 eV S.S. 5.1  
Wet samples 3x bag analysis

Method 6200 Utilized? Y ~~N~~ In-situ readings? Y ~~N~~ bagged samples  
If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

bagged samples in marked 1qt freezer bags

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.	
Mech Stg	564	cd-109	62	1000 ± 60		
Martin #1	565	cd-109	31	405 ± 46	All samples on bill	
Martin #1	566	cd-109	31	505 ± 56		
Martin #1	567	cd-109	31	284 ± 47		
William #2	568	cd-109	31	430 ± 50		
William #2	569	cd-109	31	468 ± 49		Field Rip
William #7	570	cd-109	31	585 ± 69		
William #7	571	cd-109	31	573 ± 64		
William #3	572	cd-109	31	473 ± 56		
William #3	573	cd-109	34	823 ± 72		
William #3	574	cd-109	31	705 ± 67		
620 William #4	575	cd-109	31	504 ± 40		
620 William #4	576	cd-109	31	864 ± 27		
620 William	577	cd-109	31	113 ± 30		
Front Martin RR 1	578	cd-109	31	107 ± 31		
Front Martin RR 1	579	cd-109	31	281 ± 30		
Front Martin RR 1	580	cd-109	31	872 ± 28		
Front Martin RR 2	581	cd-109	32	179 ± 45		

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 6/10/10 Site Name: Chemynak Residential Operator Name: R.L. Brown

System Check, Warm-Up and Internal Calibration Notes:

Off All samples (field samples) @ 6" 3X bag analysis  
Wet samples

Method 6200 Utilized? Y X N In-situ readings? Y N X bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

bagged samples in marked 1qt freezer bags

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
<del>Front #2</del>	<del>S82</del>	<del>cd-100</del>	<del>34</del>	<del>191 ± 37</del>	<del>@ 6"</del>
Front #2	S82	cd-100	34	191 ± 37	@ 6"
Front #2	S83	cd-100	31	189 ± 37	
Front #2	S84	cd-100	31	198 ± 40	
<del>Front #2</del>	<del>S85</del>				
S36 Front	S85	cd-100	31	134 ± 31	
S36 Front	S86	cd-100	31	161 ± 37	
S36 Front	S87	cd-100	31	144 ± 34	
S24 Front	S88	cd-100	49	176 ± 28	
S24 Front	S89	cd-100	31	180 ± 39	
S24 Front	S90	cd-100	31	146 ± 43	
Front #3 (S4)	S91	cd-100	31	174 ± 38	
Front #3 (S4)	S92	cd-100	31	98.8 ± 24	
Front #3 (S4)	S93	cd-100	31	110 ± 33	
Medi STD	S94	cd-100	62	1050 ± 61	Y
Medi STD	S95	cd-100	62	1020 ± 61	Field Rep
Medi STD	S96	cd-100	31	1020 ± 86	Field Rep 03 Sec
					OFF 1220

KDHE/Bureau of Environmental Remediation  
Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 6/3/06/10<sup>P.m.</sup> Site Name: Cherryvale Residential Yards Site Operator Name: R. Brian

System Check, Warm-Up and Internal Calibration Notes:

Wet samples 3x bag analysis

Method 6200 Utilized? Y  N  In-situ readings? Y  N  bagged samples  
If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Samples bagged in marked 1qt freezer bags (7p-10c)

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
S24 Front #2	617	cd-109	31	506 ± 48	C to 11 Sample Depth
S24 Front #2	618	cd-109	30	470 ± 45	
S24 Front #3	619	cd-109	37	734 ± 56	
S24 Front #3	620	cd-109	31	409 ± 45	
S24 Front #3	621	cd-109	31	1000 ± 80	
S20 Front #1	622	cd-109	41	647 ± 52	
S20 Front #1	623	cd-109	31	611 ± 61	
S20 Front #1	624	cd-109	31	456 ± 56	
S20 Front #4	625	cd-109	34	666 ± 94	
S20 Front #4	626	cd-109	31	966 ± 69	
S20 Front #4	627	cd-109	31	618 ± 50	
Scholar's Alley	628	cd-109	32	361 ± 56	
Scholar's Alley	629	cd-109	32	300 ± 43	
Chapel's Alley	630	cd-109	32	330 ± 47	
S20 Front #4	631	cd-109	34	859 ± 75	
S20 Front #4	632	cd-109	34	259 ± 36	
S20 Front #4	633	cd-109	37	1060 ± 74	
S20 Front #4	634	cd-109	34	944 ± 75	

KDHE/Bureau of Environmental Remediation

Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 5/06/01 Site Name: Cherryvale Res. Yards Operator Name: R Brown

System Check, Warm-Up and Internal Calibration Notes:

On 1330 Cal 1347 Res 305eJ Source strength 5mCi  
Wet samples 3X bag analysis

Method 6200 Utilized? Y X N In-situ readings? X N X bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Dugged samples in 1qt ziploc freezer bags marked

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
High STD	508	cd-109	62	5050 ± 160	
Page 6	599	cd-109	34	447 ± 49	All samples obtained
Page 6	600	cd-109	34	596 ± 53	0-6"
Page 6	601	cd-109	34	654 ± 57	
Page 7	602	cd-109	31	275 ± 35	
Page 7	603	cd-109	31	434 ± 46	
Page 7	604	cd-109	31	328 ± 38	
Martin Alley #2	605	cd-109	31	1070 ± 97	
Martin Alley #2	606	cd-109	31	1070 ± 100	
Martin Alley #2	607	cd-109	31	1040 ± 89	Field Dup
Martin Alley #2	608	cd-109	31	1330 ± 96	
Martin Alley #1	609	cd-109	31	360 ± 47	
Martin Alley #1	610	cd-109	31	640 ± 64	
Martin Alley #1	611	cd-109	32	542 ± 66	
Martin Alley #3	612	cd-109	30	1430 ± 99	
Martin Alley #3	614	cd-109	33	1630 ± 100	613 null
Martin Alley #3	615	cd-109	33	1520 ± 90	
524 Front #2	616	cd-109	31	1090 ± 85	

KDHE/Bureau of Environmental Remediation

Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/06/01 <sup>P.M.</sup> Site Name: Cherryvale Residential Yards Site Operator Name: R.L. Brown

System Check, Warm-Up and Internal Calibration Notes:

Wet samples 3x bag analysis with XRF

Method 6200 Utilized? Y X N \_\_\_ In-situ readings? Y \_\_\_ N X bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Samples bagged in 1qt Ziploc freezer bags, marked

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.	
Coyle #2	653	cd-109	81	318±33	0-6" Sample Depth	
619 Martin #1	654	cd-109	31	337±42		
619 Martin #2						N/A Slipped
619 Martin #3	657	cd-109	39	279±37		
619 Martin #5	658	cd-109	35	291±49		
619 Martin #6	659	cd-109	65	831±79		
619 Martin #7	660	cd-109	41	305±74		
619 Martin #8	661	cd-109	31	877±98		
619 Martin #9	662	cd-109	31	593±57		
619 Martin #4	663	cd-109	31	593±54		
619 Martin #4	664	cd-109	37	718±55		
High STD	665	cd-109	62	5030±160		Field Dip
High STD	666	cd-109	62	5020±150		
High STD	667	cd-109	36	4860±200		
					OFF 1645	

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/08/10 Site Name: Cherryvale Residential Yards Site Operator Name: R Brown

System Check, Warm-Up and Internal Calibration Notes:

On 0753 Cal 0815 Res 317 cal 5.6 min Dried  
All samples obtained 2/11 3X bags XRF analysis

Method 6200 Utilized? Y N In-situ readings? Y N

If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

samples Dried 48-72 hrs @ 60°C Lab correction over

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
Med STD	669	cd-109	62	1060±67	
Page 1	670	cd-109	34	610±63	
Page 1	671	cd-109	31	484±65	
Page 1	672	cd-109	34	602±67	Lab sample
Page 2	673	cd-109	35	316±50	
Page 2	674	cd-109	31	562±73	
Page 2	675	cd-109	31	479±67	
Page 3	676	cd-109	34	714±70	
Page 3	677	cd-109	30	461±56	
Page 3	678	cd-109	34	447±49	
Page 3	679	cd-109	40	416±42	Field Dup
Page 4	680	cd-109	34	460±53	
Page 4	681	cd-109	31	523±64	
Page 4	682	cd-109	35	482±51	Lab Sample
Page 5	683	cd-109	34	556±56	
Page 5	684	cd-109	31	493±54	
Page 5	685	cd-109	31	656±68	
Page 5	686	cd-109	34	618±62	Field Dup



KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/15/01 Site Name: Cherryvale Residential Yards Site Operator Name: R Brown

System Check, Warm-Up and Internal Calibration Notes:

On 1202 Warm up 1238 Res 406 eV 54 Smk  
0-6" Sample depth Dried Samples 2x bag analysis  
 Method 6200 Utilized? Y X N    In-situ readings? Y    N X

If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Dried 77 hrs @ 60°C Lab convention oven

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
High STD		cd-104	62	5120 ± 160	
Martin Alley #1		cd-104	34	1480 ± 110	0-6"
Martin Alley #2		cd-104	33	2270 ± 140	
Martin Alley #3			35	1190 ± 130	Lab Sample
536 Martin			35	142 ± 39	
" "			35	183 ± 43	
" "			35	155 ± 41	
School S Alley			32	577 ± 82	
" " "			35	<del>637 ± 75</del>	Rejected
" " "			35	383 ± 70	
			35	396 ± 72	
Martin #2			33	938 ± 94	
" "			33	1370 ± 120	
" "			35	800 ± 40	
Martin Row in School #3			34	268 ± 57	
" "			34	303 ± 55	
" "			34	247 ± 47	
" "				<del>303 ± 55</del>	Field Dup

41 273 ± 44 Field Dup

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/16/01 Site Name: Cherryvale Residential Yards Site Operator Name: RBrown

System Check, Warm-Up and Internal Calibration Notes

3x bag analysis Dried Sample depth 0-6"1

Method 6200 Utilized? Y  N  In-situ readings? Y  N  bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Dried 72 hrs @ 60°C Lab verification done

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
S24 Martin #1		CD-004	31	287 ± 55	0-6"
" " "			34	213 ± 55	
" " "			34	204 ± 45	
Page 7			34	800 ± 76	
" "			34	864 ± 80	
" "			34	740 ± 74	
" "			34	757 ± 71	Field Dup
W Martin #1			34	431 ± 53	
W Martin #1			35	275 ± 46	
" "			34	524 ± 53	
S20 Front #5			34	1180 ± 100	
" "			35	850 ± 100	
" "			34	544 ± 77	
Coyle #1			38	415 ± 54	
" "			34	454 ± 61	
" "			38	362 ± 53	
W Martin #3			30	843 ± 88	
" " "			34	969 ± 87	
" " "			34	816 ± 140	

KDHE/Bureau of Environmental Remediation

Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/06/01 P.M. Site Name: Cherryvale Residential Yards Site Operator Name: R.L. Brown

System Check, Warm-Up and Internal Calibration Notes:

Wet samples 3% bag analysis

Method 6200 Utilized? Y X N \_\_\_ In-situ readings? Y \_\_\_ N X bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Samples bagged in marked 1-gal zip-loc freezer bags

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
S20 Front #3	635	Cd-109	31	442 ± 55	0-6" sample depth
S20 Front #3	636	Cd-109	31	460 ± 54	
S20 Front #3	637	Cd-109	41	630 ± 52	
Martin #1	638	Cd-109	31	702 ± 75	
Martin #1	639	Cd-109	34	563 ± 61	
Martin #1	640	Cd-109	33	1070 ± 88	
Martin #2	641	Cd-109	33	1010 ± 84	
Martin #2	642	Cd-109	33	1280 ± 101	
Martin #2	643	Cd-109	33	944 ± 81	
Coyle #1	644	Cd-109	31	310 ± 42	
Coyle #1	645	Cd-109	31	254 ± 42	
Coyle #1	646	Cd-109	31	249 ± 41	
Coyle #1	647	Cd-109	34	233 ± 37	Field Dup
Coyle #3	648	Cd-109	31	160 ± 37	
Coyle #3	649	Cd-109	32	104 ± 33	
Coyle #3	650	Cd-109	32	170 ± 42	
Coyle #2	651	Cd-109	31	360 ± 55	
Coyle #2	652	Cd-109	35	310 ± 49	

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/15/01 Site Name: Cherryvale Residential Yards Site Operator Name: R Brown

System Check, Warm-Up and Internal Calibration Notes:

Dried Samples 3X analysis Sample depth  
0-2"

Method 6200 Utilized? Y X N \_\_\_ In-situ readings? Y \_\_\_ N X Sampled samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Dried 72 hrs @ 60°C Lab convection oven

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
High STD		62-104	62	5190±160	
S24 Front #4		}	34	1190±94	0-2"
" " "			34	1210±90	
" " "			34	1300±110	
Cowley #2			31	350±73	
" "			40	431±61	
" "			34	332±66	
S20 Front #1			34	722±77	
" " "			34	711±81	
" " "			34	485±73	
S24 Front #2			35	723±98	
" " "		34	468±85		
" " "		34	1360±110		
620 Martin			34	188±43	Lab Sample
" "			35	972±39	
" "			34	128±38	
S20 Front #3			34	930±63	Lab Sample
" " "			34	914±84	
" " "			34	1050±87	
			44	1090±82	Field Dup

KDHE/Bureau of Environmental Remediation  
Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/15/01 Site Name: Cherryvale Residential Yards Site Operator Name: R Brown

System Check, Warm-Up and Internal Calibration Notes:

Samples dried 0-6" sample depth 3x bag analysis

Method 6200 Utilized? Y X N    In-situ readings? Y    N X bagged samples  
If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Dried 27 hrs @ 60°C in lab convection oven

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
S20 Front #2		C0704	35	224 ± 60	0-6"
" " "			44	664 ± 106	
" " "			31	357 ± 63	
Martin Alley #1			35	735 ± 84	
" " "			34	764 ± 74	
" " "			35	676 ± 95	
S24 Front #3			34	1120 ± 91	Lab sample
" " "			34	894.0 ± 80	
" " "			34	1000 ± 93	
Martin Row w/ driveway #1			34	105 ± 36	
" " "			31	153 ± 51	
" " "			38	62.1 ± 34	
# 6			33	781 ± 87	
"			37	821 ± 74	
"			35	621 ± 73	
Martin #1			33	887 ± 84	
Martin #1			33	980 ± 99	
Martin #1		✓	34	795 ± 81	

High STD  
off

62 5180 ± 160

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/16/01 Site Name: Cherryvale Residential Yards Site Operator Name: \_\_\_\_\_

System Check, Warm-Up and Internal Calibration Notes:

On 08/16 Cal 08321 Res 402eV 55 Smc  
Samples dried 3x bag analysis

Method 6200 Utilized? Y  N  In-situ readings? Y  N  Dugout samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
Med STD		6200	62	1030±61	
Page 6			34	630±59	
Page 6			34	576±59	
Page 6			37	737±65	
61d Martin #5			34	1240±86	Lab Sample
619 Martin #5			34	1350±94	
619 Martin #5			34	1230±90	
61d Martin #4			38	670±57	Lab Sample
" " "			34	72±65	
" " "			34	736±65	
Martin Alley #3			37	1590±110	
" " "			33	1720±120	
" " "			33	1650±130	
Front Row E School #3			35	24±35	
" " "			31	204±41	
" " "			31	117±35	
W Martin #2			35	410±61	
" " "			35	386±68	
" " "			34	493±80	
" " "			34	474±40	
Med STD			62	1020±61	Field Dup Med STD off 1110

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/20/01 Site Name: Cherryvale Residential Yards Site Operator Name: R. Brown

System Check, Warm-Up and Internal Calibration Notes:

In 1235 Cal 1307 Res 400 e.v. Ss Sam  
Wet (undried) Samples 3x bag analysis  
 Method 6200 Utilized? Y X N     In-situ readings? Y     N X bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:  
Samples obtained @ 01, in zip-lock 1g freezer bags, marked

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
Med Std	692	cd-109	62	1050±61	
610 Front #1	693	cd-109	34	804±71	0-61
610 Front #1	694	cd-109	37	818±68	
610 Front #1	695	cd-109	33	913±74	
610 Front #2	696	cd-109	31	488±61	
610 Front #2	697	cd-109	34	319±35	
610 Front #2	698	cd-109	35	317±38	
618 Front #1	699	cd-109	34	2050±100	
618 Front #1	700	cd-109	34	1240±74	
618 Front #1	701	cd-109	33	2460±110	
618 Front #2	702	cd-109	33	1780±94	
618 Front #2	703	cd-109	33	1790±93	
618 Front #2	704	cd-109	33	1850±97	
618 Front #3	705	cd-109	31	77±27	
618 Front #3	706	cd-109	31	81.5±25	
618 Front #3	707	cd-109	31	1150±82	In brick-slag
618 Front #3	708	cd-109	38	1100±73	Field Pop
618 Front #3	708	cd-109	31	104±26	4pt

KDHE/Bureau of Environmental Remediation

Site Assessment Program

Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/20/01 Site Name: Cherryvale Residential Yards Operator Name: R. L. Brown

System Check, Warm-Up and Internal Calibration Notes:  
Wet and dried 3 samples 3X bag analysis

Method 6200 Utilized? Y X N \_\_\_ In-situ readings? Y \_\_\_ N X bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:  
Samples obtained 0-6", in marked 194 Ziploc freezer bags

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
617 Front #1	710	cd-109	37	1150±65	0-6"
617 Front #1	711	cd-109	34	1280±84	
617 Front #1	712	cd-109	33	1330±76	
617 Front #1	713	cd-109	34	724±55	
617 Front #1	714	cd-109	34	837±60	
617 Front #2	715	cd-109	31	861±73	
621 Front #1	716	cd-109	31	435±47	
621 Front #1	717	cd-109	31	416±40	
621 Front #1	718	cd-109	42	365±41	
621 Front #2	719	cd-109	34	49.3±21	
621 Front #2	720	cd-109	35	142±31	
621 Front #2	721	cd-109	35	124±29	
617 Front #4	723	cd-109	38	495±51	
617 Front #4	724	cd-109	35	512±52	
617 Front #4	725	cd-109	31	766±66	
617 Front #3	726	cd-109	31	523±55	
617 Front #3	727	cd-109	31	637±67	
617 Front #3	728	cd-109	31	740±81	

SB-2 1130 1x 40z SB-3 1135 1x 40z  
 SB-4 1145

03/20/01 Samples wet (undried) 0-6" marked

blt tip-loc bags Ran out of XRF factors!

I.D.	XL	Source	Run. Time	Lead (mg/kg)	Comments
617 Front #5	729	cd-109	37	1530 ± 90	
	<del>730</del>	cd-109	34	2000 ± 100	
	731	cd-109	31	867 ± 76	
617 Front #6	732	cd-109	31	928 ± 60	
	733	cd-109	31	812 ± 66	
	734	cd-109	31		
	735	cd-109	34	971 ± 68	
	736	cd-109	31	800 ± 65	
613 Front #2	737	cd-109	32	75.1 ± 2.9	
	738	cd-109	35	113 ± 30	
	739	cd-109	32	51 ± 25	
513 Front #1	740	cd-109	63	485 ± 35	
	741	cd-109	34	472 ± 49	
	742	cd-109	34	426 ± 53	
509 Front #1	744	cd-109	31	723 ± 41	
	745	cd-109	32	713 ± 37	
	746	cd-109	34	506 ± 51	
509 Front #2	747	cd-109	31	542 ± 57	
	748	cd-109	31	757 ± 75	
	749	cd-109	31	545 ± 60	
513 Front #4	750	cd-109	31	247 ± 45	Bin V11
	751	cd-109	31	276 ± 45	
	752	cd-109	31	254 ± 40	

VAF 2  
3 of 4



KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/27/01 Site Name: Cherryvale Residential Yards Site Operator Name: R. Brown

System Check, Warm-Up and Internal Calibration Notes:  
200832 Cal 1001 Res 401 SS Smei 3X bag analysis

Method 6200 Utilized? Y N In-situ readings? Y N bagged  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:  
Dried 7 hrs @ 60°C in Lab convection oven @ 6" sample depth

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
High STD		CD-104	85	5040 ± 130	0-6" Sample Depth
S13 Front #1			34	414 ± 99	
" "			35	375 ± 61	
" "			35	422 ± 58	
S2 Front #4			31	196 ± 34	
" " "			31	297 ± 54	
" " "			31	334 ± 57	
Q17 Front #1			33	2700 ± 150	
" " "			31	1370 ± 140	
" " "			33	1890 ± 130	
S09 Front #1			31	757 ± 84	
" " "			31	842 ± 81	
" " "			31	986 ± 91	
617 Front #2			34	2840 ± 160	Lab Sample ✓
" " "			34	1640 ± 110	
" " "			34	1520 ± 110	
Dep			34	1410 ± 110	Dep ✓

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/27/01 Site Name: Cherryvale Residential Yards Site Operator Name: R. Brown

System Check, Warm-Up and Internal Calibration Notes:  
Samples dried 3x bags analysis Dried in lab convection oven

Method 6200 Utilized? Y X N \_\_\_ In-situ readings? Y \_\_\_ N X bagged samples  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:  
Dried 72 hrs @ 60°C Samples obtained from 9-01

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
621 Front #2		Cdrpt	31	961 ± 34	Lab Sample ✓
" " "			32	128 ± 37	
" " "			37	187 ± 38	
610 Front #2			34	773 ± 77	
" " "			34	817 ± 78	
" " "			34	1030 ± 91	
617 Front #6			34	1650 ± 110	
" " "			31	1290 ± 100	
" " "			31	1450 ± 120	
618 Front #3			31	123 ± 35	
" " "			36	183 ± 40	
" " "			31	127 ± 38	
621 Front #1			31	646 ± 74	Lab Sample
" " "			31	587 ± 73	
" " "			34	678 ± 62	
618 Front #2			33	2190 ± 130	Lab Sample
" " "			31	2200 ± 190	
" " "			34	2440 ± 150	

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/27/01 Site Name: Cherryvale Residential Yards Site Operator Name: R. Brown

System Check, Warm-Up and Internal Calibration Notes:

Samples dried 3x bag analysis lab convection oven used to dry

Method 6200 Utilized? Y  N  In-situ readings? Y  N

If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:

Dried 72 hrs @ 60°C Samples obtained from 0-10"

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.
S09 Front #4		Cd-1-pq	34	1430±110	Lab Sample ✓
" " "			44	1260±83	
" " "			34	1540±110	
618 Front #1			33	3670±170	Lab Sample ✓
" " "			33	1830±96	
" " "			34	2690±160	
S09 Front #3			31	298±46	Lab Sample ✓
" " "			31	237±44	
" " "			31	254±47	
S13 Front #1			31	365±55	
" " "			31	1040±85	
" " "			31	682±72	
S09 Front #5			31	486±61	
" " "			31	354±54	
" " "			31	358±54	
617 Front #5			31	1170±95	
" " "		34	1690±110		
" " "		31	1400±110		

Dup

34 1320±110

KDHE/Bureau of Environmental Remediation  
 Site Assessment Program  
 Niton 733 X-Ray Fluorescence (XRF) Soil Analysis Field Data Sheets

Date: 03/27/01 Site Name: Cherryvale Residential Yards Site Operator Name: RBrown

System Check, Warm-Up and Internal Calibration Notes:  
3x analysis per bag All samples 0-611

Method 6200 Utilized? Y  N  In-situ readings? Y  N  bagged  
 If N, briefly explain sample preparation, homogenization, sample drying time/temp, analysis notes, etc.:  
Samples dried 22 hrs @ 60°C w/ lab convection oven

Sample I.D. #	XRF Entry #:	Source:	Run Time (sec.):	Lead (mg/kg):	Comments, Other Constituents, Concentrations, etc.	
High STD		(2-104	85	5010 ± 130	0-611	
017 Front #3		}	34	940 ± 86	}	
" " "			34	1050 ± 93		
" " "			34	1100 ± 93		
500 Front #2			34	1040 ± 91		
" " "			33	1400 ± 100		
" " "			34	1180 ± 110		
513 Front #2			31	57 ± 30		
" " "			31	98.2 ± 33		
" " "			32	117 ± 41		
5B Front #3			31	880 ± 87		Lab sample ✓
" " "			37	859 ± 71		
" " "			31	759 ± 82		
017 Front #4			31	212 ± 44		
" " "			31	646 ± 84		
" " "			31	653 ± 77		
" " "		31	735 ± 79	4th shot		
Dup		31	680 ± 75			



**ATTACHMENT E**

**PRELIMINARY REMOVAL SITE  
EVALUATION/REMOVAL PRELIMINARY  
ASSESSMENT (PRE) FORM**

**KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT  
BUREAU OF ENVIRONMENTAL REMEDIATION  
PRELIMINARY REMOVAL SITE EVALUATION/  
REMOVAL PRELIMINARY ASSESSMENT FORM**

**I. SITE NAME AND LOCATION:**

**NAME:** Cherryvale Residential Yards Site

**ADDRESS OR OTHER LOCATION IDENTIFIER:** Martin and Front Streets between Coyle and Catherine Streets

**CITY:** Cherryvale      **COUNTY:** Montgomery      **STATE:** Kansas      **ZIP:** 67335

**TELEPHONE:**      **FAX:**

**DIRECTIONS TO SITE:**

The site is located in the residential area bounded by the streets indicated above. The site is located in the SE 1/4 of Section 8, Township 32 South, Range 17 East.

**MAP ATTACHED? Yes (in RSE Report)**

**II. SITE REFERRAL INFORMATION:**

**REQUESTED BY:** Rick Bean      **DATE OF REQUEST:** 12/00

**AGENCY/OFFICE:** KDHE/Bureau of Environmental Remediation/Remedial Section

**MAILING ADDRESS:** Building 740, Forbes Field

**CITY:** Topeka      **STATE:** Kansas      **ZIP:** 66620

**TELEPHONE:** (785) 296-1675      **FAX:** (785) 296-7030

**SITE CONTACT:** Randy Brown, KDHE/BER Site Assessment Unit

**AGENCY/OFFICE:** KDHE/BER Remedial Section/Site Assessment Unit

**MAILING ADDRESS:** Building 740, Forbes Field

**CITY:** Topeka      **STATE:** Kansas      **ZIP:** 66620

**TELEPHONE:** (785) 296-8065      **FAX:** (785) 296-7030

## KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

### DEFINITION OF TERMS

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 (POTW)), 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.

OPA is the Oil Pollution Act as amended to § 311 of the Clean Water Act, with response provisions described in § 300.300-300.335 of the NCP.

**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]

PRP is potentially responsible party responsible for a release or threat of release of hazardous substances, pollutants or contaminants.

RCRA is the Resource Conservation and Recovery Act of 1976, Public Law 94-580, 40 CFR 250-299

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 any 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]

## KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

### III. REMOVAL SITE EVALUATION CRITERIA (40 CFR 300.410[E])

**A. IS THERE A RELEASE OR THREAT OF RELEASE AS DEFINED BY THE NCP?** YES  or NO   
UNKNOWN

**EXPLAIN:** Lead levels elevated above both residential and non-residential Risk-Based Standards for Kansas (RSK) were identified in several residential soil samples obtained during the PRE/RSE. Cadmium and arsenic were also detected above residential RSKs coinciding with lead levels above 1,000 mg/kg during the PRE/RSE.

**B. IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP?** YES  or NO   
UNKNOWN

**EXPLAIN:** The site is residential area impacted by an adjacent abandoned primary zinc smelter.

**C. DOES THE RELEASE OR THREAT OF RELEASE INVOLVE A HAZARDOUS SUBSTANCE, OR POLLUTANT CONTAMINANT AS DEFINED BY THE NCP?** YES  or NO   
UNKNOWN

**EXPLAIN:** Lead, cadmium, and arsenic are hazardous substances as defined in § 302.4 of the NCP.

**D. IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE?** YES  or NO   
UNKNOWN

**EXPLAIN:** No limitations on response exist at the Cherryvale Residential Yards site.

**E. DOES THE QUANTITY OR CONCENTRATION WARRANT RESPONSE:** YES  or NO   
UNKNOWN

**EXPLAIN:** Removal response is warranted because levels of lead, cadmium and arsenic were detected in excess of residential RSK levels for lead (400 mg/kg), cadmium (39 mg/kg) and arsenic (11 mg/kg) at the site. Elevated cadmium and arsenic levels above three times (3X) background appear to coincide with lead levels above 1,000 mg/kg from review of laboratory data. Lead was detected at a maximum of 3,680 mg/kg by laboratory analysis in the 618 Front Street #2 sample. Cadmium was detected at a maximum of 160 mg/kg in the 619 Martin #5 sample location. The maximum arsenic detection was 33.7 mg/kg in 618 Front #2. Further removal site evaluation is recommended to the south at least to First Street to further evaluate residential yards since the southern extent of impacted yards was not identified during this RSE. Future removal response should be coordinated with potential National Priorities List (NPL) inclusion and consistent with the overall long-term remedial response objectives for this site.

**F. HAS A PRP BEEN IDENTIFIED?** YES  or NO

**CURRENT OWNER:** Multiple

**CURRENT OPERATOR:** Inactive

**FORMER OPERATORS:** Edgar Zinc Company, National Zinc Company

**G. WHAT IS THE CURRENT LAND USE AROUND THE FACILITY?**

RESIDENTIAL  COMMERCIAL  RECREATIONAL  INDUSTRIAL  AGRICULTURAL  WHAT

**IS THE LIKELY FUTURE ZONING OF THE AREA AROUND THE FACILITY?**

RESIDENTIAL  COMMERCIAL  RECREATIONAL  INDUSTRIAL  AGRICULTURAL

**ECONOMIC CONDITIONS SURROUNDING THE SITE, (INDUSTRIALIZED, LOW INCOME, RESIDENTIAL, ETC.):**

The site area is located in mixed residential and light commercial area at the north edge of Cherryvale, Montgomery County, Kansas.

**H. REGULATORY/OPERATIONAL HISTORY OF THE SITE:**

According to Sanborn Fire Insurance maps for the Cherryvale Residential Yards area, the residential area appears to have been the location for support facilities such as a store, church, school, fire station, etc. connected with the National Zinc site. Most of the original National Zinc structures appear to have been demolished and removed by the 1950s from the residential area evaluated for the PRE/RSE.

**KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION**

**IV. CONDITIONS TO WARRANT REMOVAL 940 CFR 300.415(b)(2):**

**A. IS THERE AN ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES, OR POLLUTANTS, OR CONTAMINANTS?**      YES X    NO \_\_\_

**DEFINE THE MEDIA, PATHWAY AND RECEPTOR:**

**GROUND WATER**    YES \_\_\_    NO \_\_\_    UNKNOWN X    **RECEPTOR:** local private wells

**EXPLAIN:** The site is located in a broad, low-relief upland of the Osage Questas physiographic area of southeast Kansas. Bedrock of Pennsylvanian age is present at the base of the soil profile. During the installation of temporary monitoring wells at the site, bedrock was typically encountered between 14 feet (TW-1) and 3.5 feet (TW-8). The bedrock units underlying the site are believed to be composed of sandstone and limestone of the Cherryvale Shale and Dennis Limestone Formations of the Kansas City Group. A yellowish to reddish-brown sandstone was typically encountered as the bedrock layer upon auger refusal during the National Zinc BTA. Ground water occurrence within the Cherryvale Shale and Dennis Formations is typically localized with very low (less than 3 gallons per minute) yields of generally poor quality. These bedrock units typically yield little to no water except in the shallow weathered zone near the upper bedrock surface. Oil field intrusion of brines in the site area from oil production dating back to the early 1900s has impacted shallow ground water quality regionally in this portion of Southeast Kansas (Reference 4). Ground water occurrence in the site area is primarily restricted to unconsolidated alluvial deposits of the Verdigris River and Drum Creek. The City of Cherryvale receives water from a surface intake on Big Hill Lake located approximately five (5) miles east of Cherryvale. Significant karst terrain does not exist in the site area given the sequential shale-sandstone-limestone stratigraphy of the bedrock units. The City of Cherryvale and Montgomery County Rural Water District # 12 supplies water to private residences surrounding the site.

**SURFACE WATER**    YES X    NO \_\_\_    UNKNOWN \_\_\_    **RECEPTOR:** environmental targets, potential downstream drinking water intakes

**EXPLAIN:** The site drainage is to an unnamed tributary of Drum Creek which also drains the National Zinc site. The confluence of this unnamed tributary and Drum Creek is approximately 3/4 mile west of the National Zinc site. Previous surface water releases of sludges have been historically reported from the National Zinc site. Surface water sampling for the National Zinc ESI will further evaluate the surface water pathway. Sediment samples obtained for the BTA have indicated a 3 X background concentration of lead, cadmium and zinc in the surface water ditch draining the National Zinc site.

**SOIL**                    YES \_\_\_    NO \_\_\_    UNKNOWN X    **RECEPTOR:** nearby residents

**EXPLAIN:**

Lead, cadmium and arsenic were identified above residential RSKs at the site. At least eleven (11) residential yards were identified as impacted during the PRE/RSE. The primary native soil type identified within undisturbed areas within the site boundaries is the Kenoma series. The Kenoma soils are generally deep, moderately well drained, very slowly permeable soils on uplands. Typical depth of Kenoma soils averages 60 inches or greater. The southern edge of the site is also within the Dennis series, but the native soil profile for this series is very similar to the Kenoma series. There are no other soils in this series.

**WASTE**                    YES X    NO \_\_\_    UNKNOWN \_\_\_    **RECEPTOR:** nearby residents

**EXPLAIN:**

Surficial smelter waste is present at the National Zinc site immediately north of the residential area evaluated for the PRE/RSE. The National Zinc BTA and ESI contain additional information regarding wastes at the National Zinc site.

**AIR**                        YES \_\_\_    NO \_\_\_    UNKNOWN X    **RECEPTOR:** nearby residents

**EXPLAIN:**

No conditions were observed to indicate a potential release to air at the site. Care should be exercised during removal response to minimize potential dust emissions containing elevated concentrations of lead and cadmium to adjacent residential areas.

## KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

**B. IS THERE ACTUAL OR POTENTIAL CONTAMINATION OF DRINKING WATER SUPPLIES? YES \_\_\_ NO \_\_\_ UNKNOWN X**

**EXPLAIN:** The residences in the site area are served with drinking water from the Cherryvale PWS system which utilized a surface water source. No private wells were identified in use within one mile of the site.

**C. ARE THERE HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS, BULK STORAGE CONTAINERS OR TANKS? YES \_\_\_ or NO X UNKNOWN \_\_\_**

**EXPLAIN:** No bulk storage or disposal of containerized hazardous substances or potential hazardous wastes was identified at the site during the PRE.

**D. ARE THERE HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS? YES X or NO \_\_\_ UNKNOWN \_\_\_**

**SURFACE SOIL CONTAMINATION? YES X NO \_\_\_ UNKNOWN \_\_\_**

**SURFICIAL WASTES PRESENT? YES X NO \_\_\_ UNKNOWN \_\_\_**

**EXPLAIN:** Lead, cadmium and arsenic were identified in excess of residential RSKs at the site.

**SITE ACCESSIBILITY: SECURE \_\_\_ ACCESS LIMITED \_\_\_ READILY ACCESSIBLE X**

**EXPLAIN:** The site is located in a readily accessible area bounded by residential properties.

**E. ARE THERE CONDITIONS ON SITE WHICH MAY BE SUSCEPTIBLE TO IMPACT FROM ADVERSE WEATHER CONDITIONS? YES \_\_\_ or NO \_\_\_ UNKNOWN/UNCERTAIN X**

**EXPLAIN:** Runoff from exposed smelter waste piles, transport by air or truck traffic from the former National Zinc site has apparently caused releases of heavy metal constituents to adjacent residential soils.

**F. IS THERE A THREAT OF FIRE OR EXPLOSION? YES \_\_\_ or NO X**

**EXPLAIN:** No potentially flammable, ignitable, corrosive or unstable wastes were observed to be stored or managed in a manner to increase risk of fire. The site does not appear to pose a serious fire threat.

**G. IS THERE A POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS? IF SO, IDENTIFY THE APPROPRIATE PROGRAM: YES \_\_\_ or NO X**  
 RCRA \_\_\_ NRC \_\_\_ FIFRA/TSCA \_\_\_ UST \_\_\_ OTHER FEDERAL \_\_\_ STATE DEFERRAL \_\_\_\_\_

**EXPLAIN:** Identification/confirmation of PRPs has not been successful to date. The site appears to qualify for removal response consistent with the NCP and may also be a candidate for inclusion to the National Priorities List (NPL) and future remedial response actions.

**H. ARE THERE ENDANGERED SPECIES HABITATS, WETLANDS, OR OTHER SENSITIVE ENVIRONMENTS NEARBY WHICH MAY BE ADVERSELY IMPACTED BY THE SITE? YES X or NO \_\_\_**

**EXPLAIN:** Residential areas are located within the site boundaries.

**I. ARE THERE OTHER SITUATIONS OR FACTORS WHICH POSE A THREAT? YES X or NO \_\_\_ UNKNOWN \_\_\_**

**EXPLAIN:** Elevated levels of lead, cadmium and arsenic were identified in this PRE adjacent to residential areas with little or no access control. This site may qualify for inclusion on the National Priorities List (NPL) and further removal response actions should be consistent and coordinated with future NPL remedial response actions and objectives.

## KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

### V. POTENTIAL REMOVAL ACTIONS (40 CFR 300.415 [D]):

*The following identifies potential removal actions which may be determined to be appropriate pending further review and study. The proposed actions should be considered preliminary proposals and are subject to change.*

**SITE SECURITY:** YES  or NO

**EXPLAIN:** Elevated lead levels are present in residential areas.

**DRAINAGE CONTROL:** YES  or NO

**EXPLAIN:** Runoff from former smelter production/ waste areas at the site may be impacting adjacent surface water and sediments in the residential areas during flood periods.

**STABILIZATION OR REMOVAL OF SURFACE IMPOUNDMENTS:** YES  or NO

**EXPLAIN:** No surface impoundments are present at the site.

**CAPPING OF CONTAMINATED SOIL:** YES  or NO

**EXPLAIN:** Capping of contaminated soils may be an option for areas in excess of RSK soil screening levels to eliminate surficial exposure or further direct contact, air releases or surface water runoff.

**USE OF CHEMICALS TO CONTROL/RETARD SPREAD OF CONTAMINATION:** YES  or NO

**EXPLAIN:** Retardants or stabilizing agents for heavy metals have been effective at other sites in stabilizing lead and cadmium to minimize leaching or bioavailability.

**CONTAMINATED SOIL EXCAVATION:** YES  NO  UNKNOWN

**EXPLAIN:** Soils in areas in excess of RSK screening concentrations may be best addressed by strategic excavation.

**REMOVAL OF DRUMS, TANKS, OR BULK STORAGE CONTAINERS:** YES  NO

**EXPLAIN:** No abandoned drums containing waste material were identified at the site. Preliminary soil analysis obtained during the PRE/RSE indicates that lead levels would not likely exceed TCLP criteria and are therefore would not likely be RCRA hazardous (D008) waste.

**CONTAINMENT, TREATMENT, OR DISPOSAL OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS:** YES  NO  UNKNOWN

**EXPLAIN:** Some limited areas of soils may require stabilization. Further sampling at the site may indicate additional areas of waste and impacted soils requiring treatment and/or disposal.

**PROVIDE ALTERNATIVE WATER SUPPLIES:** YES  or NO

**EXPLAIN:** All areas at the site are supplied with water by the Caney public water supply (PWS) system.

**KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION**

**VI. REMOVAL SITE EVALUATION DETERMINATION AND REMOVAL PRELIMINARY ASSESSMENT FINDINGS AND RECOMMENDATIONS:**

**REMOVAL ACTION/ASSESSMENT/FURTHER REMOVAL SITE EVALUATION CONSISTENT WITH §§ 300.410-300.415 OF THE NCP RECOMMENDED: YES  NO**  (RSE contingent on PRP negotiations)

**PRIORITY?  EMERGENCY RESPONSE  TIME CRITICAL  NON-TIME CRITICAL**

**FURTHER INTEGRATED CERCLA REMEDIAL SITE EVALUATION/RESPONSE CONSISTENT WITH THE NCP RECOMMENDED?: YES  NO**  (Completion of ESI currently underway)

(Cite one or more of the criteria from SECTION III - REMOVAL SITE EVALUATION CRITERIA, as the basis for the above determination.)

<input checked="" type="checkbox"/>	RELEASE OR THREAT OF RELEASE	<input checked="" type="checkbox"/>	RELEASE INVOLVES FACILITY OR VESSEL
<input checked="" type="checkbox"/>	HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT INVOLVED IN RELEASE	<input checked="" type="checkbox"/>	NO RESPONSE LIMITATIONS
<input checked="" type="checkbox"/>	SUFFICIENT QUANTITY OR CONCENTRATION	<input checked="" type="checkbox"/>	NO WILLING/CAPABLE PRP RESPONSE
<input checked="" type="checkbox"/>	ACTUAL OR POTENTIAL EXPOSURE THREATS		DRUMS, BARRELS OR BULK CONTAINERS PRESENT
<input checked="" type="checkbox"/>	HIGH LEVELS OF CONTAMINANTS IN SURFACE SOILS	<input checked="" type="checkbox"/>	SITE SUSCEPTIBLE TO ADVERSE WEATHER CONDITIONS
	THREAT OF FIRE OR EXPLOSION		NO OTHER PROGRAM FOR RESPONSE

(Identify one or more of the removal actions listed in Section V. POTENTIAL REMOVAL ACTIONS, as examples of the types of response actions which are recommended.)

<input checked="" type="checkbox"/>	SITE SECURITY - ACCESSIBILITY	<input checked="" type="checkbox"/>	DRAINAGE CONTROL
	IMPOUNDMENT STABILIZATION	<input checked="" type="checkbox"/>	SOIL CAPPING
<input checked="" type="checkbox"/>	CHEMICAL CONTROLS	<input checked="" type="checkbox"/>	SOIL EXCAVATION
	REMOVAL OF DRUMS, BARRELS, ETC.	<input checked="" type="checkbox"/>	CONTAIN/THREAT/DISPOSE OF WASTES
	ALT. DRINKING WATER SUPPLIES	<input checked="" type="checkbox"/>	SURROUNDINGS/OTHER (EXPLAIN):

**COMMENTS:** Conditions at the site warrant further removal site evaluation and removal response consistent with § 300.415 of the NCP. Elevated levels of lead, cadmium and arsenic in or near residential areas has been identified in the PRE/RSE. The full extent of impacted yards was not identified during the PRE/RSE, and a Phase II RSE is recommended to extend the area of sampling south to First Street between Coyle and Catherine Streets.

Additional remedial site evaluation is currently underway through completion of the ESI at the National Zinc site. Completion of the ESI may indicate that a Hazard Ranking System (HRS) scoring package for inclusion to the National Priorities List (NPL) is appropriate. The Phase II RSE should proceed parallel to ESI/HRS activities to address potential risk and provide further removal site evaluation consistent with § 300.410-300.415 to additional residential yards beyond the extent of this PRE/RSE.

## KDHE/BER PRELIMINARY REMOVAL SITE EVALUATION

### VII. FIELD METHODS AND PROCEDURES

Eleven (11) residential yards were evaluated for the Cherryvale Residential Yards PRE/RSE. Samples were obtained into 1-quart marked zip-lock freezer bags and a laboratory split obtained and placed in a 4-oz prepared heavy metals analysis jar. The RSE Report contains sampling procedures, analytical results, consideration of quality control (QC) criteria and other information in greater detail. The site-specific Quality Assurance Project Plan (QAPP) for the Cherryvale Residential Yards RSE was adhered to for all PRE/RSE site activities.

### VIII. FINAL REMARKS AND RECOMMENDATIONS:

A release of hazardous substances to residential yards of lead, cadmium and arsenic above three times background (3X) and KDHE residential RSKs has been identified in the PRE/RSE.

The extent of residential yard contamination was not identified in the RSE. A Phase II RSE is recommended to further evaluate residential yards to the south to First Street between Coyle and Catherine Streets. The Cherryvale Residential Yards site appears to qualify for further removal response actions consistent with § 300.415 of the NCP.

The Expanded Site Inspection of the National Zinc site is underway, and data from this PRE/RSE will be used to supplement the ESI, especially with regards to the soil pathway. Upon completion of the ESI, the site may be a candidate for completion of a Hazard Ranking System package and listing on the National Priorities List (NPL).

Further removal response may also be appropriate at the site but should be consistent with overall remedial objectives for the site. If the site is listed on the NPL, residential areas impacted by elevated levels of heavy metals above residential RSKs should be prioritized for initial remedial/removal response actions if not previously conducted.

### IX. EVALUATOR/REVIEW:

**SIGNATURE:** \_\_\_\_\_ **DATE:** March 27, 2001

**Randolph L. Brown, Site Assessment Unit Chief**

**POSITION/TITLE:** Environmental Geologist/Unit Chief, Site Assessment Unit

**OFFICE/AGENCY:** KDHE/Bureau of Environmental Remediation/Remedial Section

**REVIEWED BY:** \_\_\_\_\_ **DATE:** March 29, 2001

**Rick L. Bean, Section Chief, Remedial Section/Bureau of Environmental Remediation**

## ATTACHMENT F

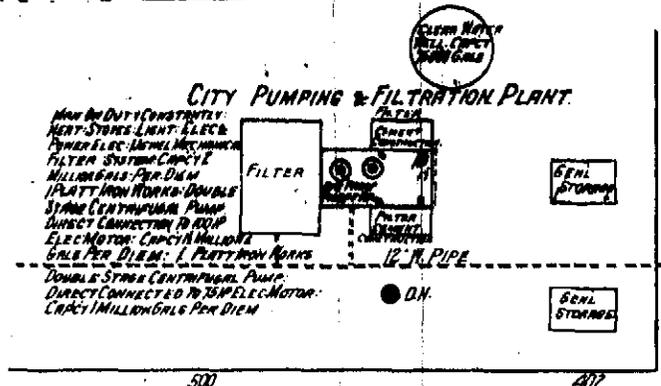
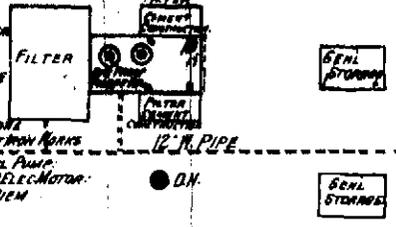
PORTIONS OF SANBORN FIRE INSURANCE  
MAPS FOR CHERRYVALE, KANSAS 1905-1928



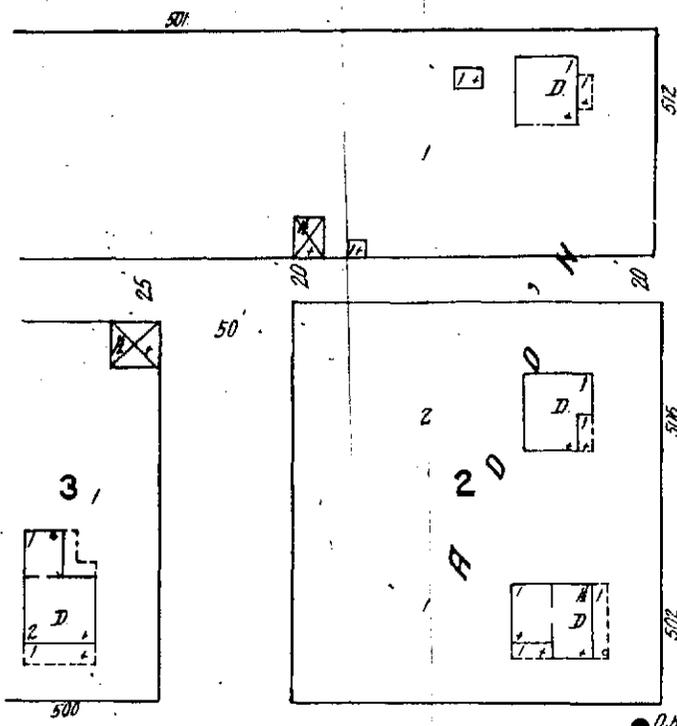


### CITY PUMPING & FILTRATION PLANT.

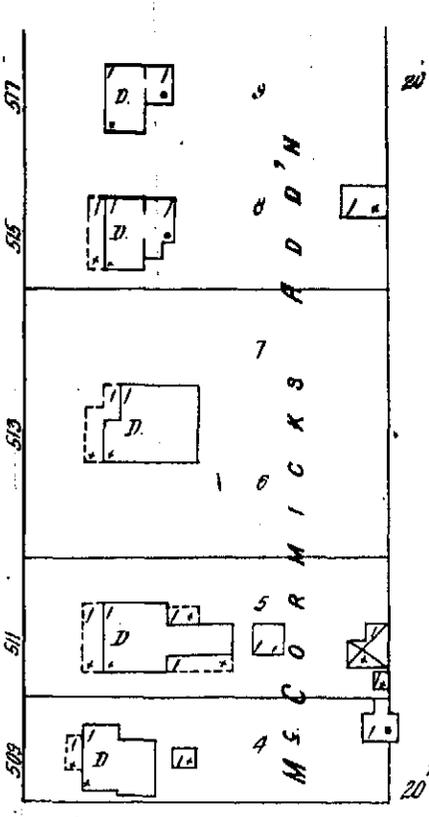
MAXIMUM DUTY CONSTANTLY  
 FIFTY STOPS PER HOUR  
 FILTER SYSTEM CAPACITY  
 MILLION GALS. PER DIEM  
 PLANT FROM WORKS DOUBLE  
 STAGE CENTRIFUGAL PUMP  
 DIRECT CONNECTION TO ADD  
 ELECTRIC MOTOR CAPACITY MILLION  
 GALS PER DIEM - 1 PLANT FROM WORKS  
 DOUBLE STAGE CENTRIFUGAL PUMP  
 DIRECT CONNECTION TO 750 ELEC. MOTOR  
 CAPACITY MILLION GALS PER DIEM



### MARTIN

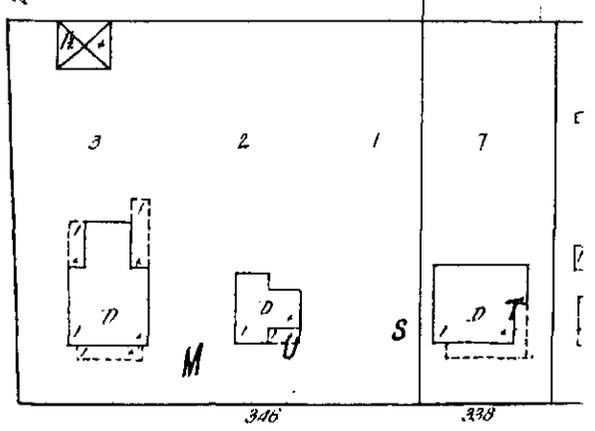


60' 12" PIPE

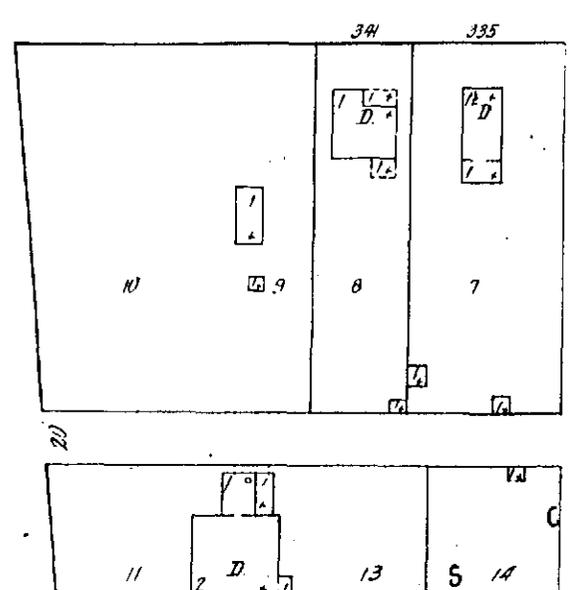
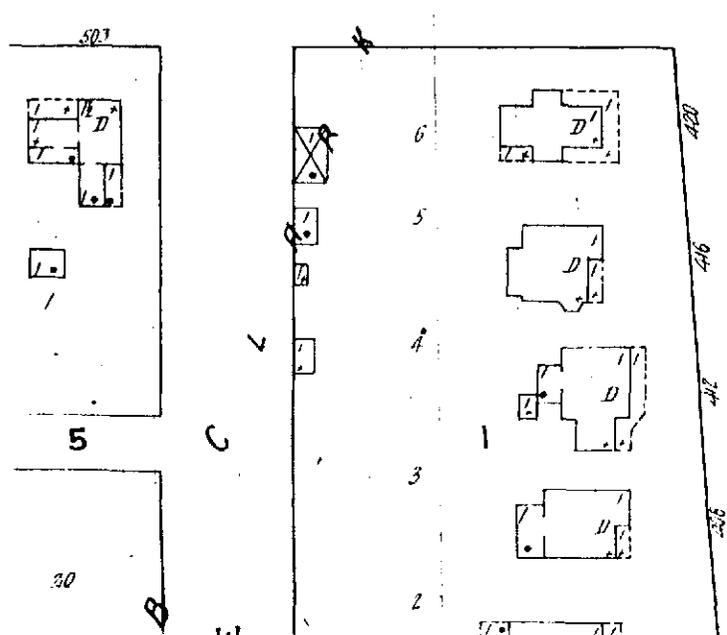


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### W. FRANK



### N. LIBERTY



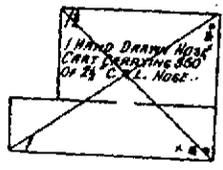
8 70 E. 7TH ST.

ON 202



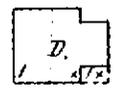
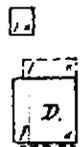
13

13



DEC. 1911  
CHERRYVALE  
KAS.

50' OFF.  
N. SCHOOL

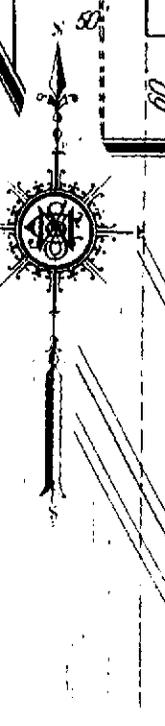


MARTIN

# EDGAR ZINC CO CHERRYVALE DIVISION

*RUNS DAY & NIGHT.*

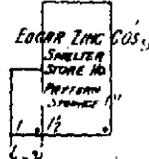
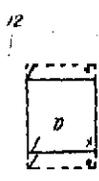
NIGHT WATCHMAN NEWMAN'S PORTABLE WATCHMAN'S  
CLICK; 6 STATIONS. HOURLY ROUNDS.  
HEAT: NAT'L GAS STOVES, FUEL OIL & NAT'L GAS LIGHTS. FIVE  
1 WORTHINGTON DUPLEX P.P. SIZE 14" x 12" 8" SUCTION  
8" DISCHARGE WITH 2 1/2" HOSE CONNECTIONS. CAPCY.  
300 GALS. PER MINUTE. (150' 2 1/2" C.R. HOSE IN GOOD  
CONDITION. 500' ON HAND. 350' IN HOSE CART AND  
300' P.T.D. TO 2 1/2" NYLON 8" MOUNTED ON HOSE CARTS  
STAND FIVE BASE IN WHICH IS LLEV'D TO ABOVE GROUND  
CAPCY. 15,000 GALS.



6

N O E X P O S U R E

UNPAVED

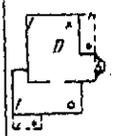


MARTIN UNPAVED

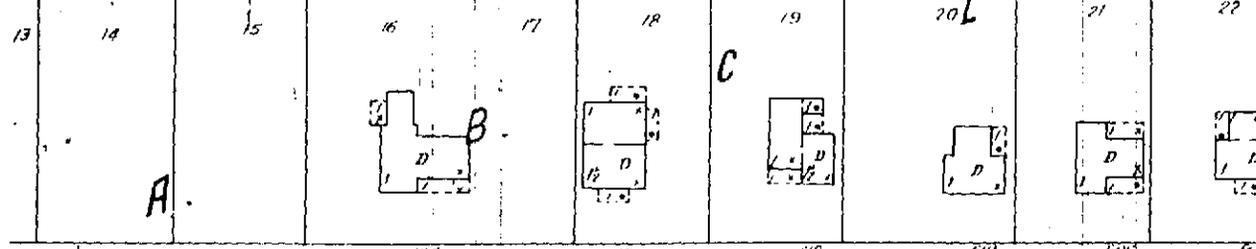
N. CATHERINE



UNPAVED

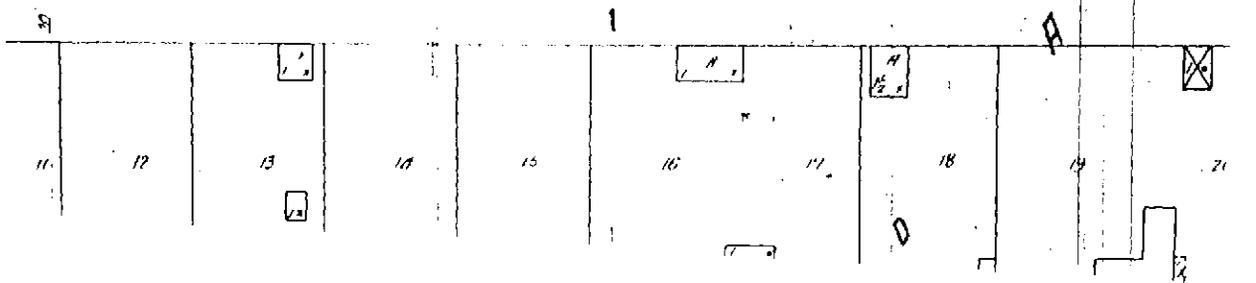
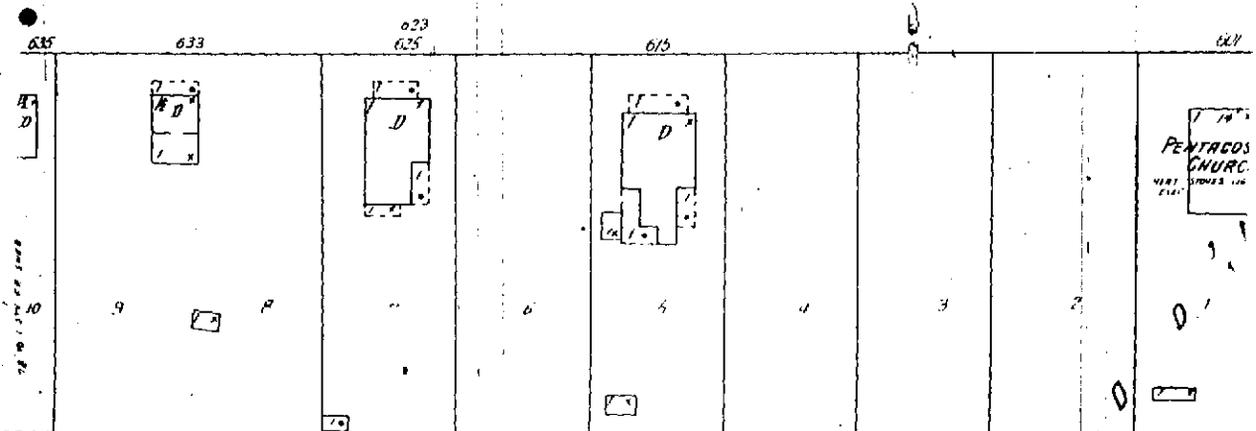


N O E X P O S U R E



UNPAVED

W. 2ND



PENTECOS CHURCH



N O E X P O S U R E

1637 P.A.D.

W. 4<sup>TH</sup> ST.

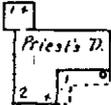
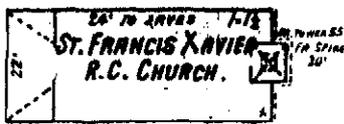
ST.

60'

8'

C O Y L E S

1<sup>ST</sup> A D D.



5

416

W. 5<sup>TH</sup> ST.

ST.

50'

50'

DETACHED FR. DW'GS OPP.

S. LIBERTY

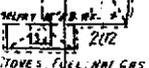
4

A N T

60'

3<sup>RD</sup> A D D.

DE PUBLIC SCHOOL.



SCHOOL

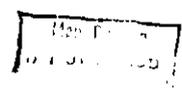
1<sup>ST</sup> P.A.D.

W H E L A N ' S 4<sup>TH</sup> A D D N

CHERRYVALE BUTTER & CHEESE FAC.  
 (Not in Operation)  
 (ILLUMINATED)



MARTIN



60'

60'

MAIN

Scale of Feet.



98'

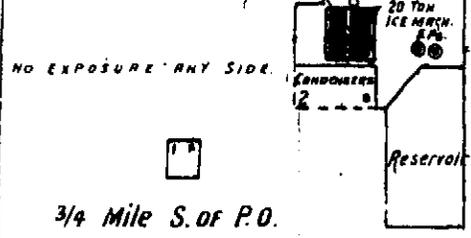
10' W.P.  
 42' W.P.  
 42' W.P.

60'



EIGHT  
PLATFORM  
RT&S.F.R.R.

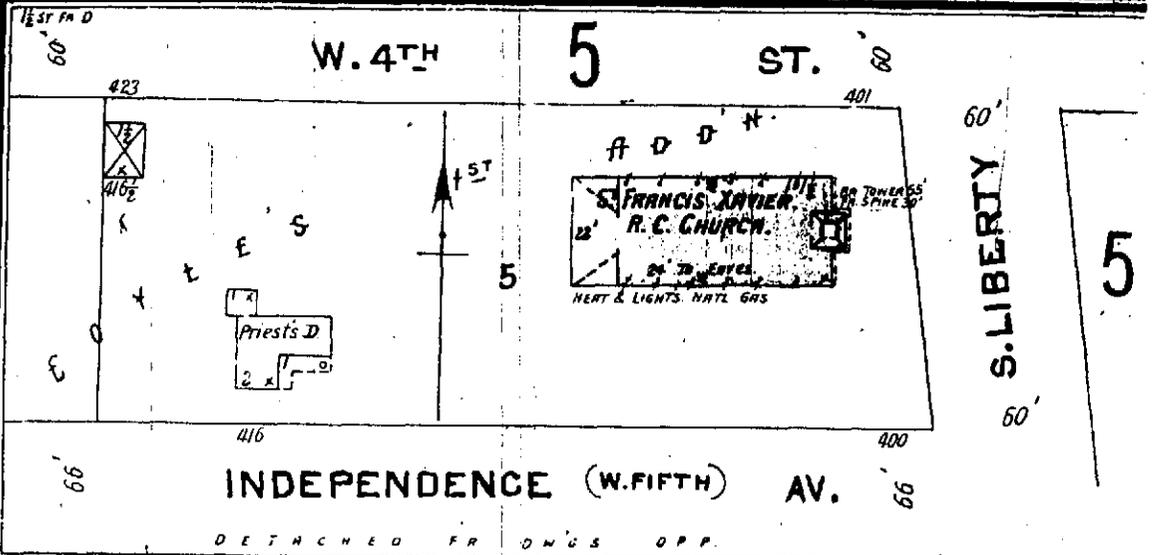
DUPLEX P.P. 8' X 12' X 8' X 10' 4' 1' DRAIN  
FROM LAKE TANK & CITY. COMBINED  
CAPY. 1/2 MILLION GALLS. PER 24 HOURS  
TO HAVE 100' 1/2" DIAM. HEAD. LIGHT &  
FUEL: NATL. GAS.



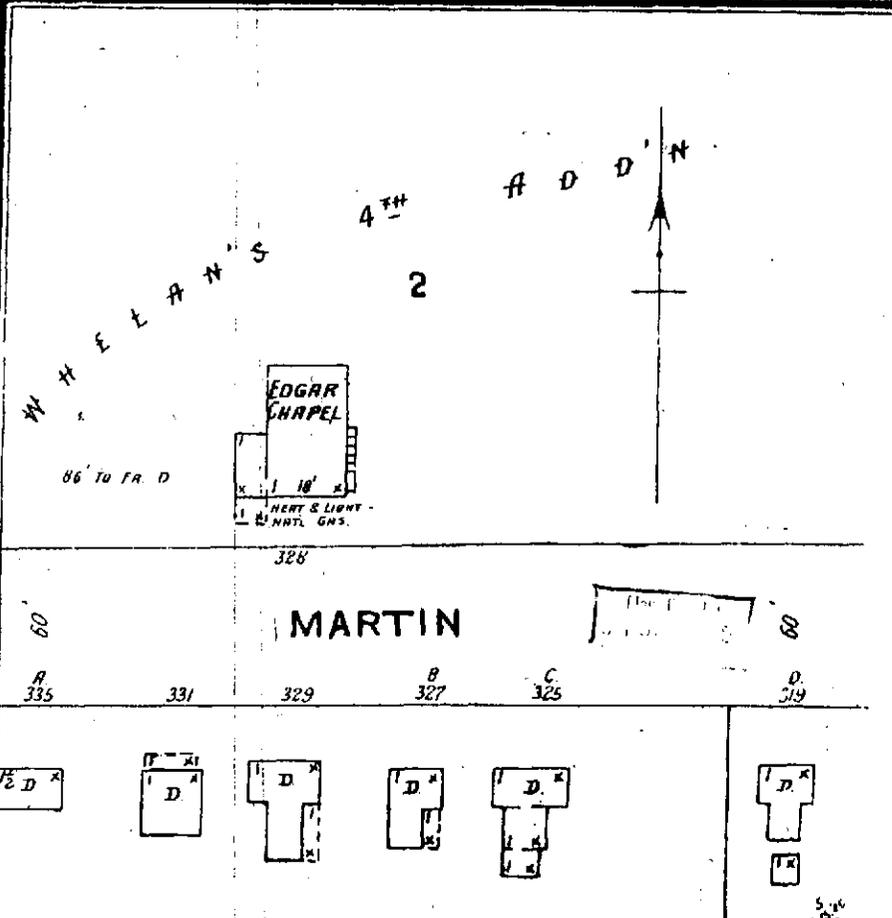
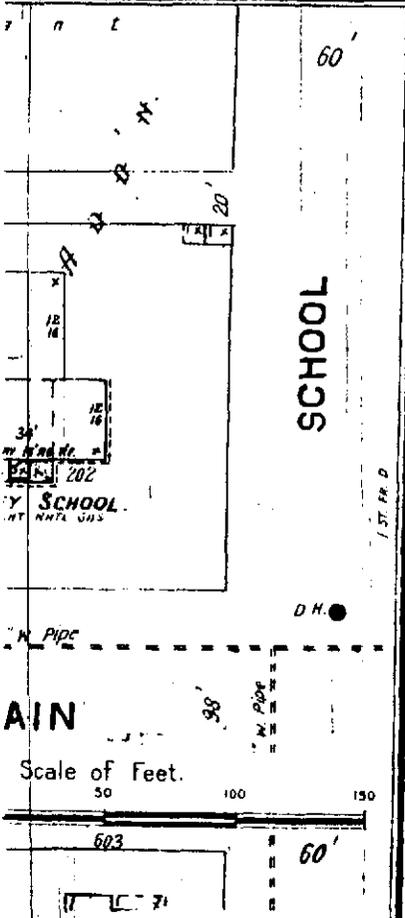
3/4 Mile S. of P.O.

R.T. & S.F.R.R. (COFFEYVILLE)

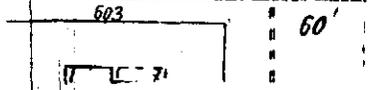
Lake Tank



DETACHED FR DWGS OPP.



Scale of Feet.  
50 100 150



# ATTACHMENT G

## RESIDENTIAL YARD SAMPLING FORMS

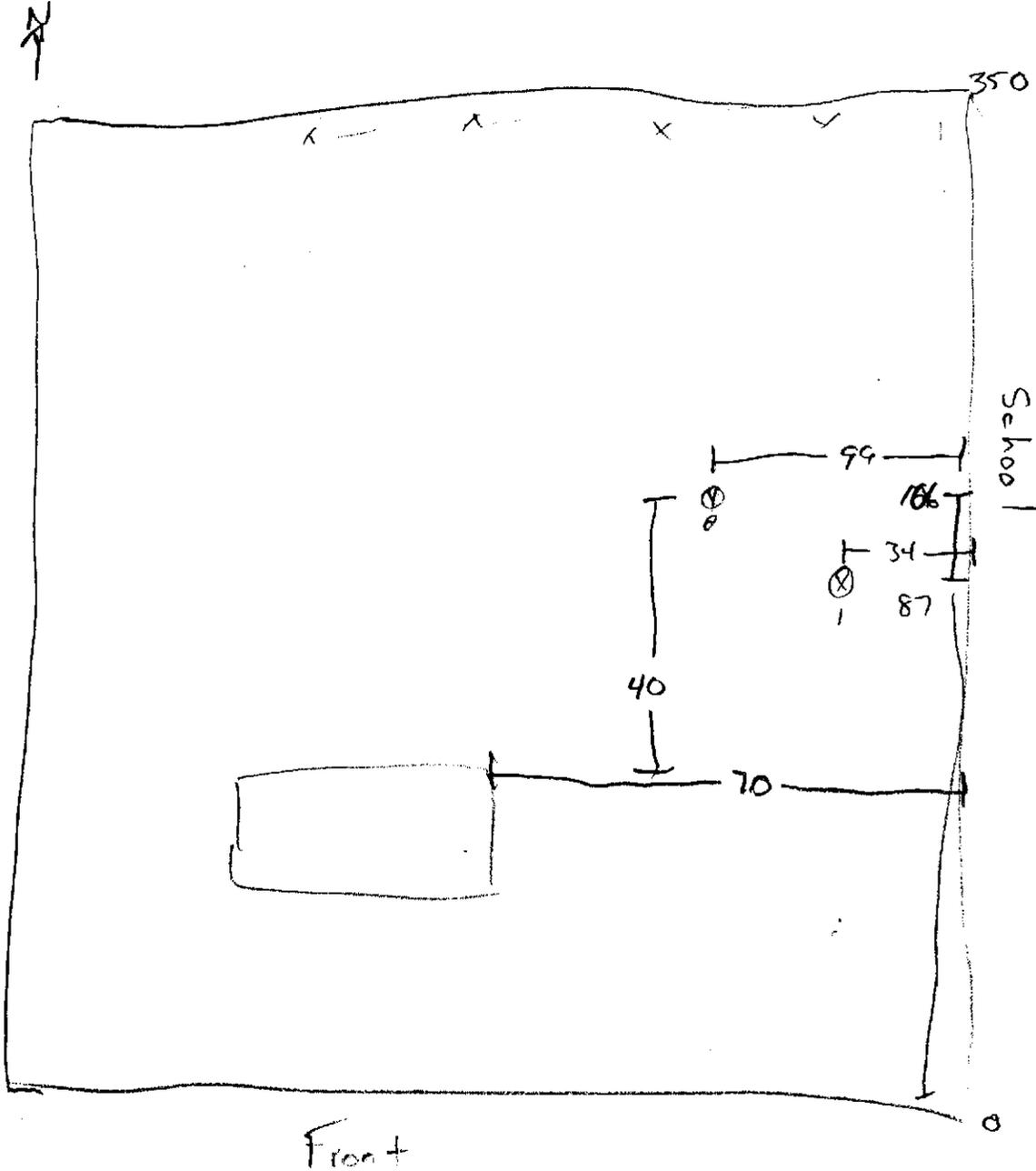
Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

610 Front

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):

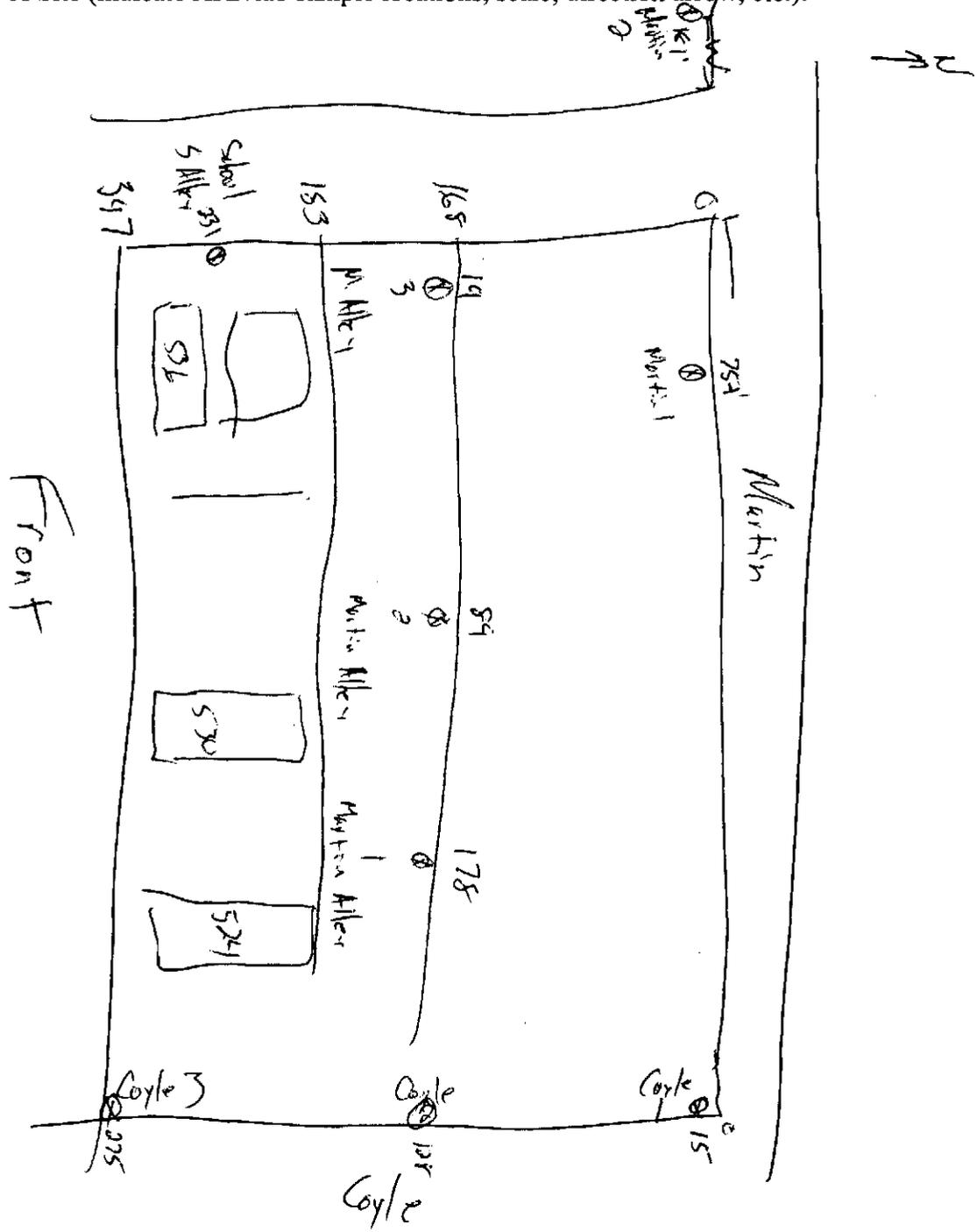


### Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



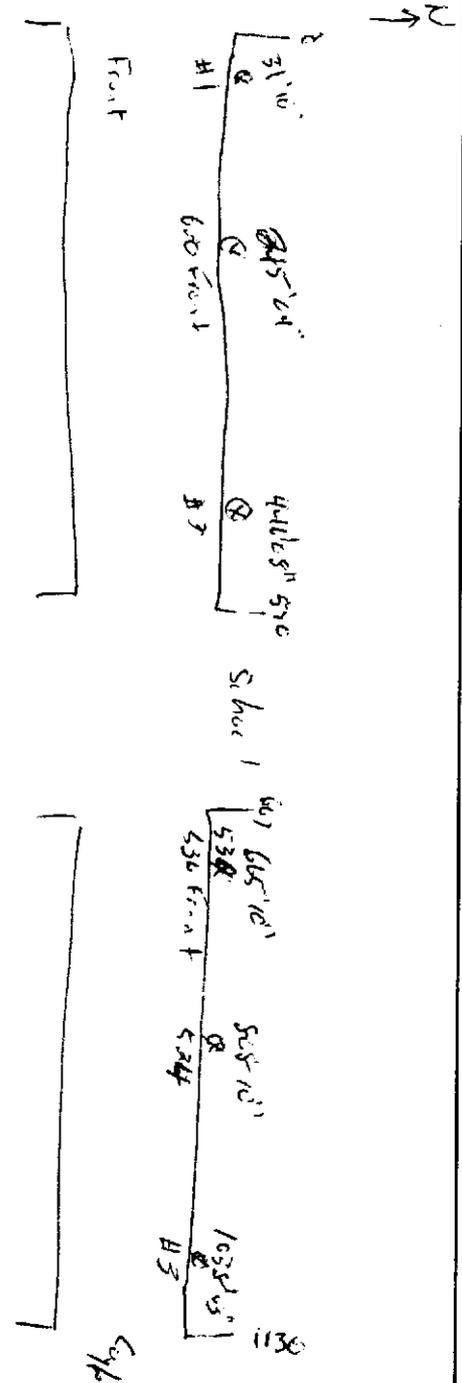
Residential Yard XRF Sampling Form

### Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



Residential Yard XRF Sampling Form

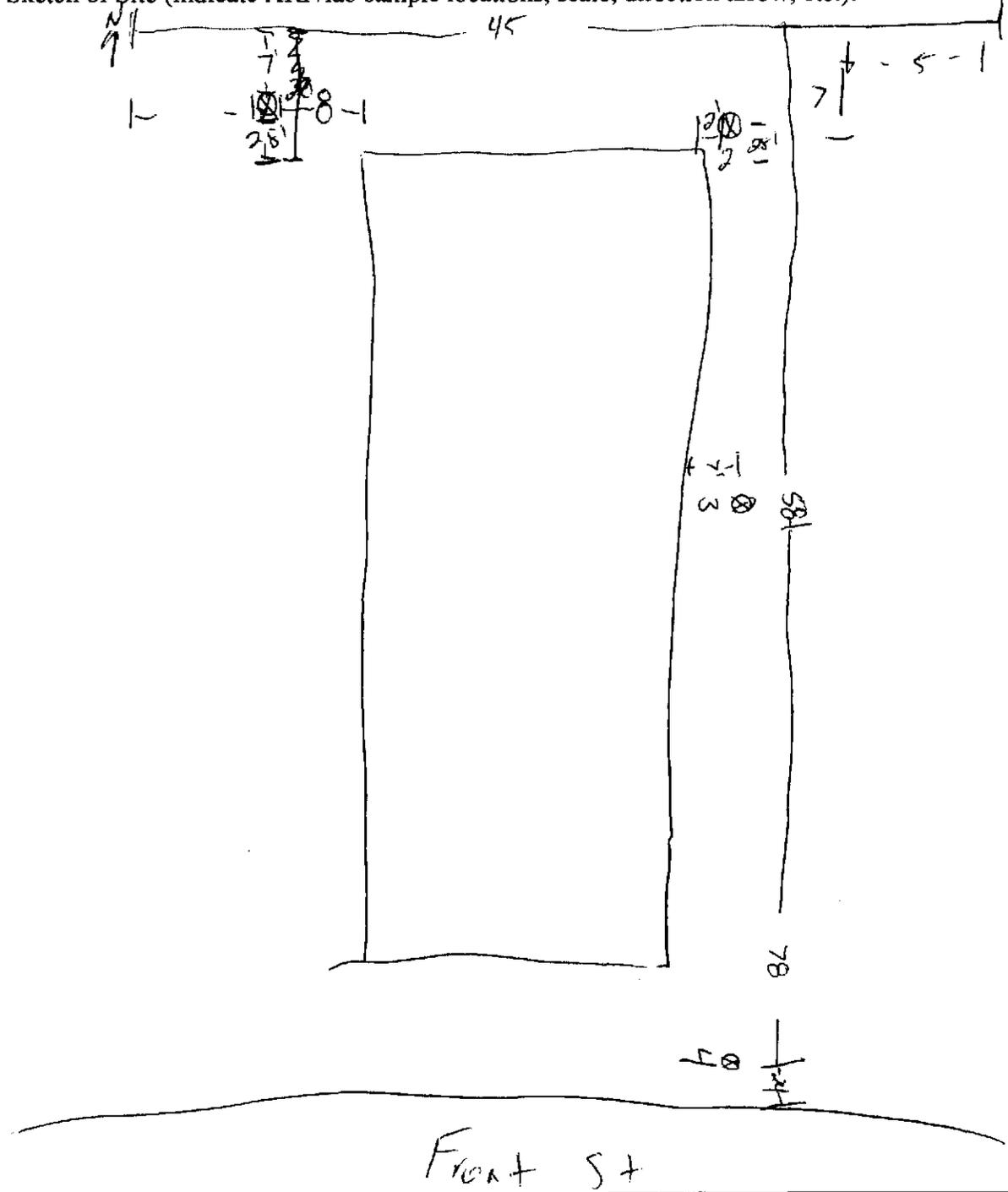
Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

520 Front St

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



Residential Yard XRF Sampling Form

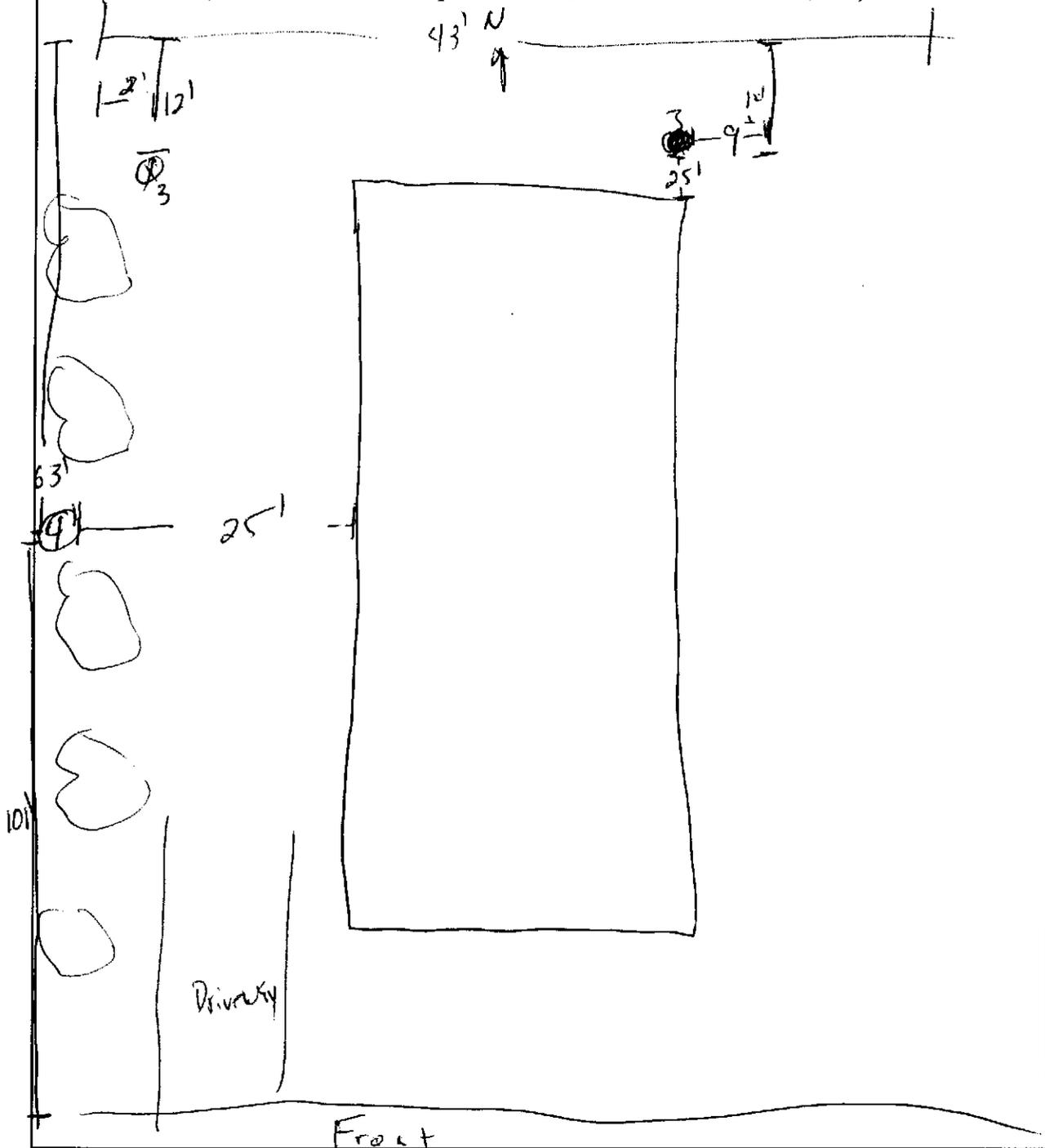
Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

524 Front

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



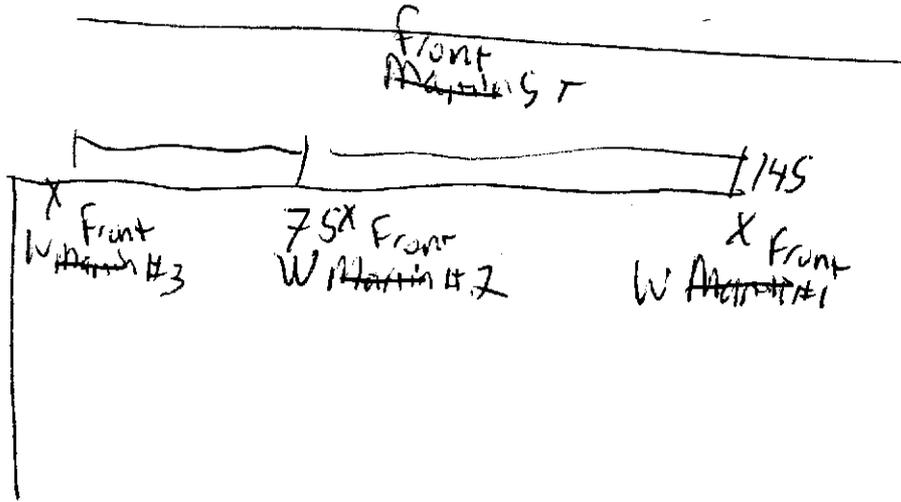
Residential Yard XRF Sampling Form

Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



Cherryvale Residential Yards Site Sampling Form

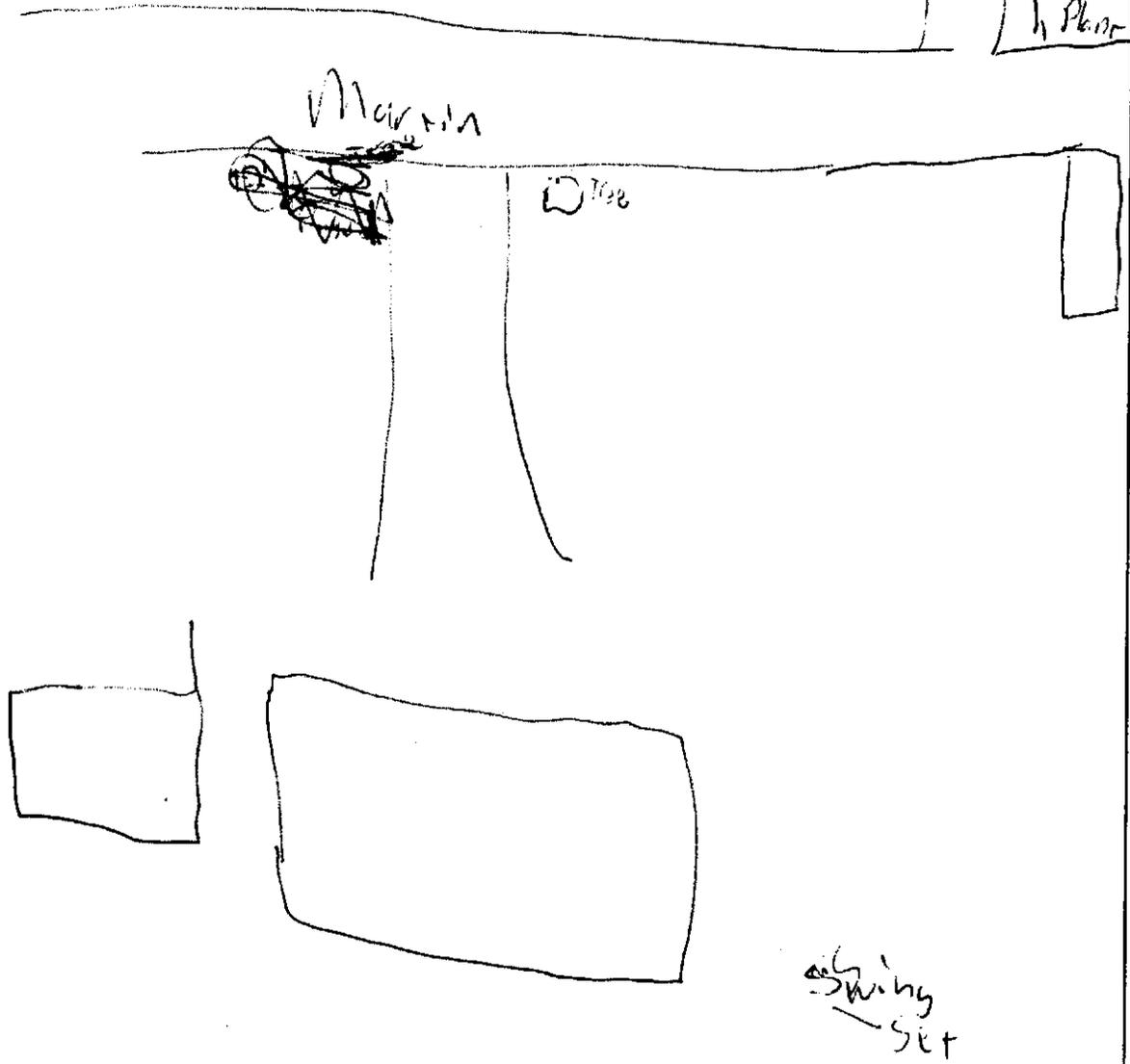
Resident Name:

Page

Resident Address:

511 Martin

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



Cherryvale Residential Yards Site Sampling Form

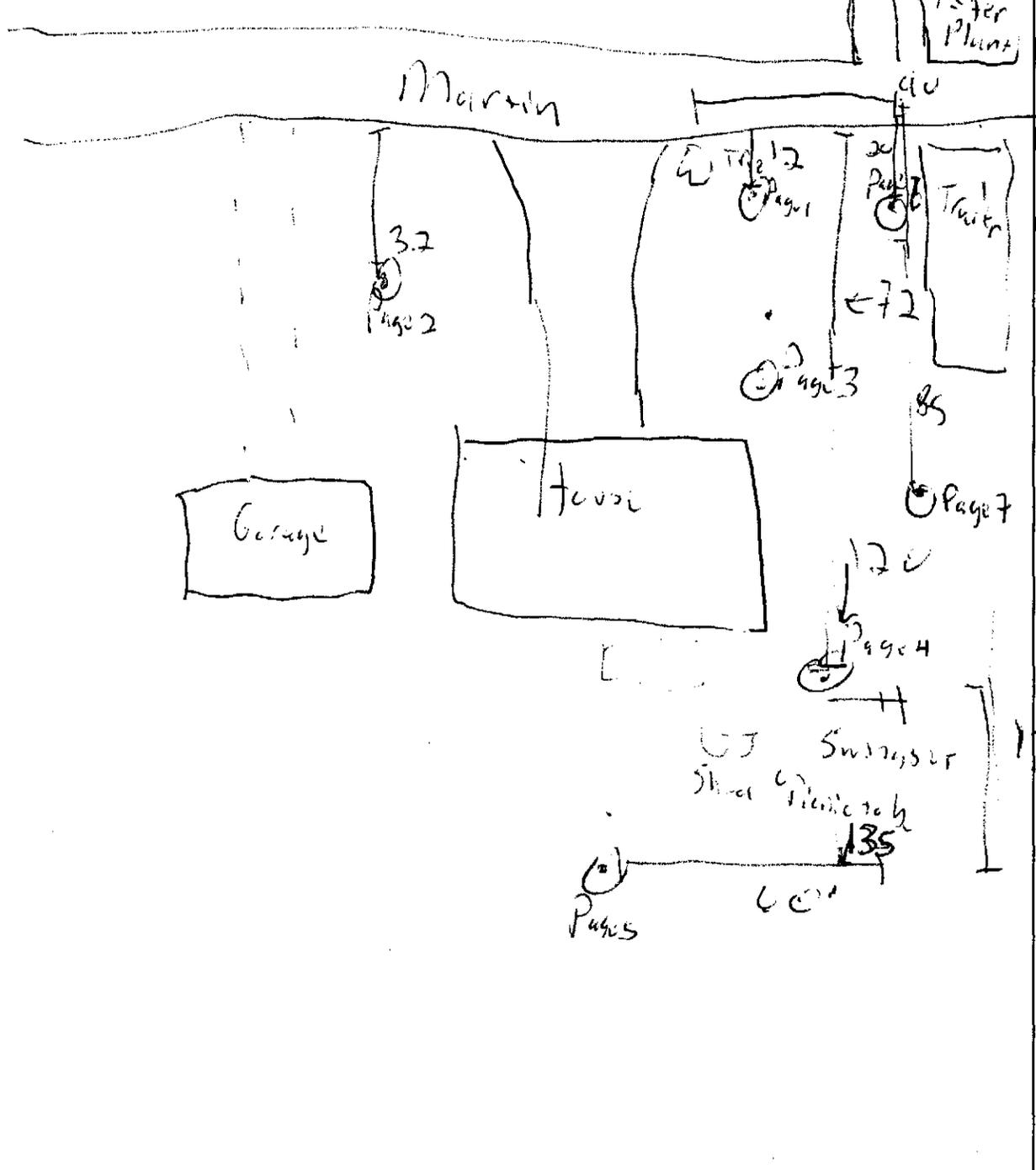
Resident Name:

Page Pur 103/05/01

Resident Address:

511 Martin

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



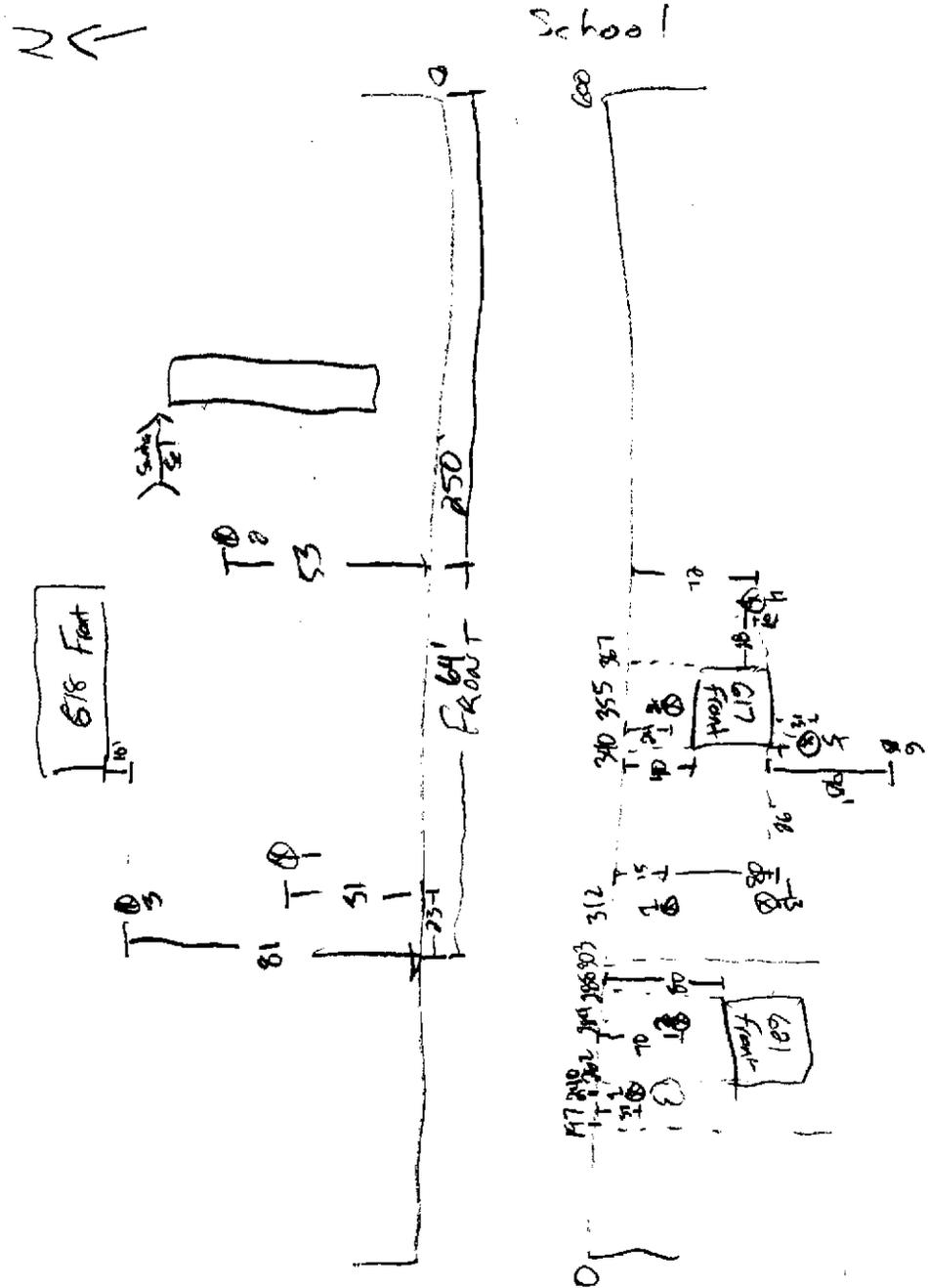
Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

FRONT SRRROW

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



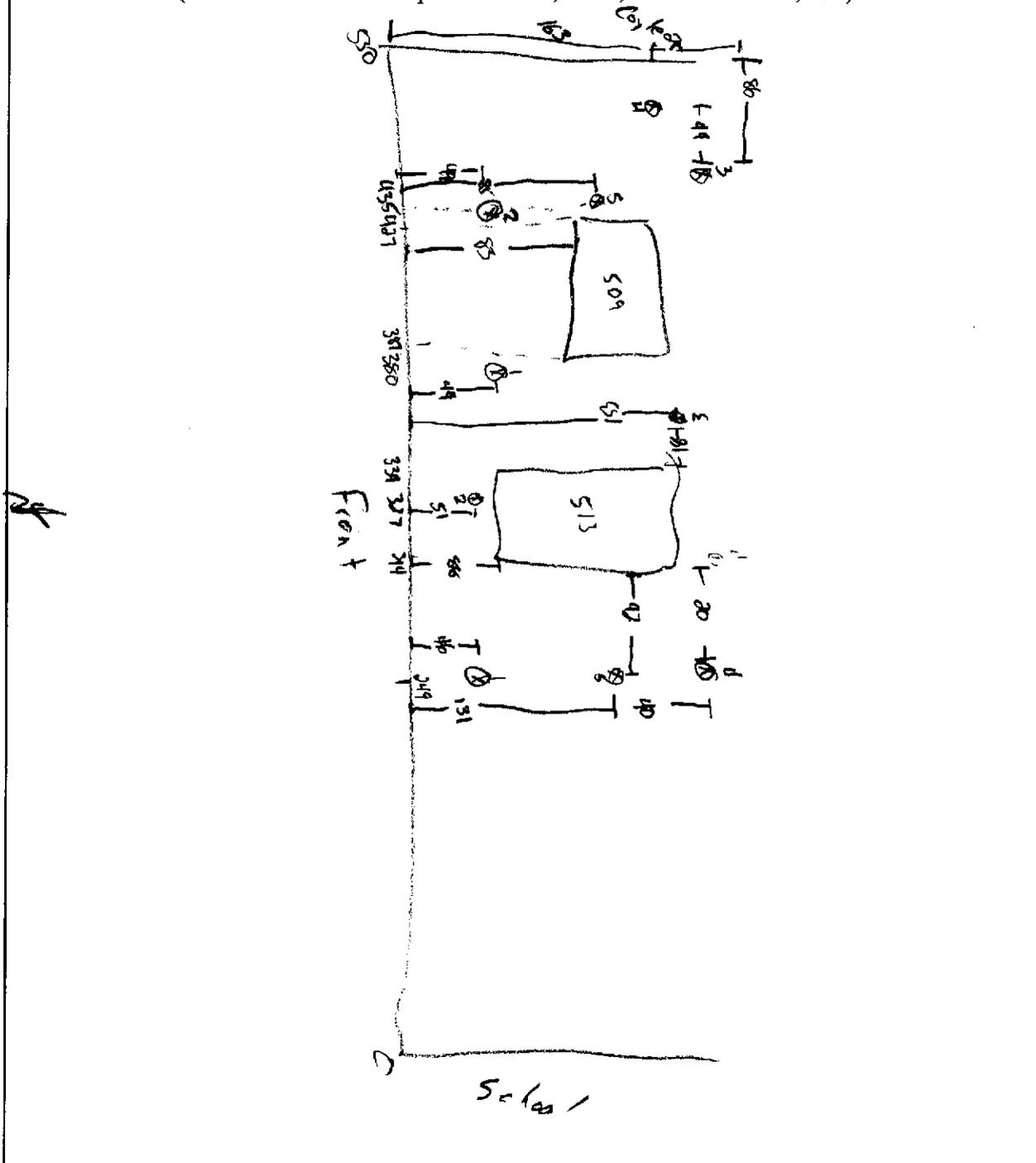
Cherryvale Residential Yards Site Sampling Form

Resident Name:

Resident Address:

509 / 513 Front

Sketch of Site (indicate XRF/lab sample locations, scale, direction arrow, etc.):



## ATTACHMENT H

### PRE-CERCLIS CHECKLIST AND INITIATION FORMS

# PRE-CERCLIS SCREENING ASSESSMENT CHECKLIST/DECISION FORM

This checklist can assist the site investigator during the Pre-CERCLIS screening. It will be used to determine whether further steps in the site investigation process are required under CERCLA. Use additional sheets, if necessary.

**Checklist Preparer:** Randolph L. Brown Site Assessment Unit Chief 03/27/01  
 (Name/Title) (Date)  
Building 740, Forbes Field (785) 296-8065  
 (Address) (Phone)  
Rbrown@kdhe.state.ks.us  
 (E-Mail Address)

**Site Name:** 901 East Santa Fe Site

**Previous Names (if any):** Coastal Mart # 1177 UST Trust Fund Site

**Site Location:** 901 East Santa Fe Drive  
 (Street)  
Olathe, Kansas 66061  
 (City)

**Legal Location:** Section 36, T. 13 S., R. 23 E

Complete the following checklist.	YES	NO
1. Does the site already appear in CERCLIS?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is the release from products that are part of the structure of, and result in exposure within, residential buildings or businesses or community structures?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Does the site consist of a release of naturally occurring substances in its unaltered form, or altered solely through naturally occurring processes or phenomena, from a location where it is found naturally?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Is the release into a public or private drinking water supply due to deterioration of the system through ordinary use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is some other program actively involved with the site (i.e. another Federal, State, or Tribal program)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Are the hazardous substances potentially released at the site regulated under a statutory exclusion (i.e., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the NRC, UMTRCA, or OSHA)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Are the hazardous substance potentially released at the site excluded by policy considerations (e.g., deferral to RCRA Corrective Action)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Does sufficient documentation exist that clearly demonstrates that there is no potential for release that could cause adverse environmental or human health impacts (e.g., comprehensive remedial investigation equivalent data showing no release above ARARs, completed removal action, previous HRS score determined, ASTM Phase I, II, etc. completed, EPA approved risk assessment completed)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Please explain all "yes" answer(s), attach additional sheet if necessary:** An Expanded Site Inspection (ESI) is currently underway at the adjacent National Zinc site. Pending ESI results/HRS listing, further removal response options should be coordinated and consistent with ESI/HRS/NPL actions.

**Regional EPA Reviewer:** \_\_\_\_\_  
 Print Name/Signature Date

**State Agency/Tribe:** Randolph L. Brown 03/29/01  
 Print Name/Signature Date



NO EPA ID

NO DISCOVERY DATE

NPL Status = O-NOT A VALID SITE OR INCIDENT

Site Name: Cherryvale Residential Yards Site Initiated Date 03 / 29 / 01 Initiated By: Removal X Site Assessment

List Site Alias Name (s): National Zinc Residential Yards Site

Address: Martin and School Street (center of site) County Name: Montgomery

City, State, Zip: Olathe, Kansas 67335 State ID (if one exists): C306371097 Congressional District: 04

NPL Status: NOT A VALID SITE OR INCIDENT Federal Facility?: Yes X No

Section: C-(SACR) Site Assessment/Cost Recovery Branch X L-(EFLR) Enfr/Fund Lead RV Branch Kansas State Lead

F-(FFSE) Federal Facilities/Apecial Emphasis Brnach M-(MOKS) MO/KS remedial Branch

I-(IANE) IA/NE Remedial Branch O-(ER&R) Emergency Response & RV Branch

Directions to Site: South on Manhattan Avenue from Fort Riley Boulevard

Site Description:

Site Size: 20

Site Dimension: X Acres Square Feet Feet Square Miles Miles

Site Type (Choose one): Disposal Storage Midnight Dump Transportation Related Other Treatment Production Facility (active) Production Facility (inactive)

USGS Quadrant: Cherryvale USGS Hydro Unit:

Latitude: 39 42 30.00 Longitude: 96 25 00 Treatment (active)

Lat/Long Accuracy: X Seconds Miles Feet

Degrees Minutes Kilometers Meters RCRA Site:

Lat/Long Source: EPA Region 7 EPIC Operational Status: Active X Inactive Unknown

Regulated Entity X Private Geograph

SNAP Other Other Fed Agency

Contractor EPA HQ Contractor

Owner Operator Bank/Loan Company Incident Type: Non-Oil Spill Oil Spill X Unknown

Type(choose one): County Owned District Owned Federally Owned Former Federally Owned or Operated Government Owned/Contractor Operated Privately Owned/Government Operated Property Defaulted Back to Government Municipality Indian Lands Other State Owned Private Trustee, Federal X Mixed Ownership Trustee, State Incident Category: Abandoned Fire/Explosion Pure Lagoons Chemical Plant Landfill Radioactive Site City Contamination Groundwater Inorganic Waste Dioxin Military Related Mines/Tailings Ecological Damage Other Unknown Federal Facility Biological Threat X Smelter Housing Area/Farm Wells Manufacturing Plant Industrial Waste Treatment Waterways/Creeks/Rivers

Add Action: PRE-CERCLIS SURVEYS Planned Complete: 03/31/01 Actual Complete: 03/29/01 OU 00

Lead code (choose one): F-EPA Fund Finaced FF - Federal Facility X S - State, Fund Finaced SCAP Note:

Comment: X Site or Action: Separate CERCLIS entry not recommended pending ESI/HRS status; may need removal start if actions not completed as part of NPL site actions

Non-NPL Status (Choose one): Addressed as part of NPL site (AX) Integrated ESI RI Ongoing (IO) SI Start Needed (SS) Combined PA/SI Ongoing (CO) Integrated ESI/RI Start Needed (IS) SIP Ongoing (SG) Combined PA/SI Start Needed (CS) Integrated Removal/Remedial Evaluation Ongoing (IN) SIP Start Needed (SN) Deferral of NPL Listing Dec. While States Overseer Resp. (SD) Integrated Removal/Remedial Eval Start Needed (IR) Site Reassessment Ongoing (SR) X ESI Ongoing (EO) NFRAP (NF) Status Not Specified (SX) ESI Start Needed (ES) Other Cleanup Activity: Fed Fac-lead Cleanup (OF) Site Reassessment Start Needed (RN) Fed Fac ESI Review Start Needed(FE) Other Cleanup Activity: Private Party-Lead Cleanup (OP) Fed Fac Prelim Assessment Rev Ongoing (PG) Other Cleanup Activity: State-Lead Cleanup (OS) Fed Fac Prelim Assessment Rev Start Needed(PN) PA Ongoing (PO) Fed Fac Site Inspection Rev Ongoing (FG) PA Start Needed (PS) Fed Fac Site Inspection Rev Start Needed (FS) Ref to Removal-Further Assessment Needed (RW) HRS Ongoing (HO) Referred to Removal - NFRAP (RR) HRS Package Completed-Further Eval. Needed (HN) Removal Only Site (No Site Assess Work Needed) (RO) HRS Start Needed (HS) SI Ongoing (SO)

Signatures: State: Date: 03/29/01 RPM/OSC/SAM: Date: / /