



TETRA TECH EM INC.

March 2, 2007

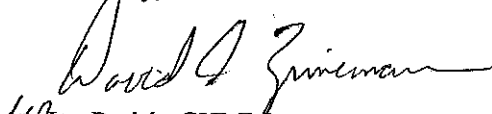
Mr. Roy Crossland  
START Project Officer  
U.S. Environmental Protection Agency, Region 7  
901 North 5th Street  
Kansas City, Kansas 66101


**Subject: Pre-CERCLIS Site Screening Assessment  
Jefferson County Lead Site  
EPA Region 7, START Contract No. EP-S7-06-01  
Task Order 0002.012  
Task Monitor: Jim Silver, On Scene Coordinator**

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the attached Pre-Comprehensive Environmental Response, Compensation and Liability Information System Site Screening Assessment for the above-referenced site. If you have any questions or comments regarding this submittal, please contact the project manager at (314) 892-6322.

Sincerely,

  
Joe Parish, CHMM  
Project Manager

  
Ted Faile, PG, CHMM  
START Program Manager

Enclosures



**PRE-CERCLIS SITE SCREENING ASSESSMENT REPORT  
JEFFERSON COUNTY LEAD SITE  
JEFFERSON COUNTY, MISSOURI**

**Superfund Technical Assessment and Response Team (START) 3  
Contract No. EP-S7-06-01, Task Order No. 0002.012**

Prepared For:

U.S. Environmental Protection Agency  
Region 7  
901 North 5<sup>th</sup> Street  
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March 2, 2007

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## CONTENTS

| <b><u>Section</u></b>                                       | <b><u>Page</u></b> |
|---|--------------------|
| 1.0 INTRODUCTION .....                                      | 1                  |
| 2.0 BACKGROUND INFORMATION .....                            | 1                  |
| 2.1 LOCATION .....  | 1                  |
| 2.2 PHYSICAL SETTING .....                                  | 2                  |
| 2.3 HISTORY .....   | 3                  |
| 2.4 PREVIOUS INVESTIGATIONS AND WASTE CHARACTERISTICS ..... | 4                  |
| 3.0 CURRENT INVESTIGATION ACTIVITIES .....                  | 5                  |
| 3.1 SITE RECONNAISSANCE .....                               | 5                  |
| 3.2 SOIL AND SEDIMENT SAMPLING .....                        | 5                  |
| 3.3 GROUNDWATER SAMPLING .....                              | 6                  |
| 3.4 SURFACE WATER SAMPLES .....                             | 7                  |
| 4.0 DATA SUMMARY .....                                      | 7                  |
| 4.1 SOIL AND SEDIMENT SAMPLES .....                         | 7                  |
| 4.2 GROUNDWATER SAMPLES .....                               | 8                  |
| 4.3 SURFACE WATER SAMPLES .....                             | 8                  |
| 5.0 SUMMARY AND CONCLUSIONS .....                           | 8                  |
| 5.1 PRE-REMEDIAL CONSIDERATIONS .....                       | 8                  |
| 5.2 REMOVAL CONSIDERATIONS .....                            | 9                  |
| 6.0 REFERENCES .....  | 10                 |

## **Appendix**

|   |   |
|---|---|
| A | TABLES  |
| B | FIGURES   |
| C | DETAILED MINE LOCATION MAPS OF JEFFERSON COUNTY             |
| D | GENERAL SOIL MAP OF JEFFERSON COUNTY                        |
| E | PHOTOGRAPHIC DOCUMENTATION                                  |
| F | PROPERTY SCREENING SHEETS                                   |
| G | ANALYTICAL DATA, CHAIN-OF-CUSTODY RECORDS, AND FIELD SHEETS |
| H | REGION 7 SUPERFUND PRE-CERCLIS SCREENING FORM               |



## **1.0 INTRODUCTION**

The Tetra Tech EM, Inc. (Tetra Tech) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division, under the Superfund Technical Assessment and Response Team (START) contract, task order 0002.012, to conduct a Pre- Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Site Screening Assessment (SSA) of areas potentially contaminated with metals associated with former lead, barite, and zinc mining activities in Jefferson County, Missouri. To complete this Pre-CERCLIS SSA, START conducted an Internet search for background information; reviewed historical mining information in the Missouri Geological Survey Inventory of Mines, Occurrences, and Prospects (IMOP) database (Appendix A, Table 1); interviewed county and state government personnel; and performed limited sampling of environmental media to screen potentially impacted areas. Joe Parish served as the START project manager for this activity, under the direction of EPA Region 7 On Scene Coordinator (OSC), Jim Silver.

## **2.0 BACKGROUND INFORMATION**

### **2.1 LOCATION**

Jefferson County is located in southeastern Missouri (Appendix B, Figure 1). It is bordered on the north by St. Louis County and the Meramec River; on the east by the Mississippi River; on the south by St. Genevieve and St. Francis Counties; and on the west by Washington and Franklin Counties. The County encompasses 664 square miles. According to the 2000 census, the population of Jefferson County is 198,099 people. The county seat is located in Hillsboro, Missouri. Jefferson County was organized in 1818 and named in honor of former President Thomas Jefferson (Wikipedia 2006).

The study area for the pre-CERCLIS SSA included 252 potential mining sites located throughout Jefferson County that were identified on maps prepared from the IMOP database (see Appendix C) (Missouri Department of Natural Resource [MDNR] 2005a). For purposes of this study, Jefferson County was divided into four quadrants: northeast (NE), northwest (NW), southeast (SE), and southwest (SW) (Appendix B, Figure 1). The NE quadrant contains six mining sites, the NW quadrant contains 12 mining sites, the SE quadrant contains 42 mining sites, and the SW quadrant contains 192 mining sites. START sampled tailings, surface water, sediment, residential soils, and private drinking water wells at or near some of the mining sites. Since the SW quadrant contained most of the identified mining sites, sampling activities focused on that area. This study did not include the greater Herculaneum area because the impact of this area is being addressed under a separate Potentially Responsible Party (PRP) lead removal action.



## **2.2 PHYSICAL SETTING**

Jefferson County lies on the margin of the Springfield-Salem Plateaus section of the Ozark Plateau physiographic province. It is further divided into seven distinct physiographic regions, trending from the northeast to the south. These include the Dissected Till Plains, the River Hills, the Zell Platform, the Burlington Escarpment, the Crystal Escarpment, the Salem Plateau, and the Avon Escarpment (U.S. Department of Agriculture [USDA] 2000). The landscapes in these regions are controlled by characteristics of the underlying rock units, such as bedrock thickness, weathering properties, and age.

Exposed bedrock units in Jefferson County range in age from Cambrian to Pennsylvanian. The bedrock units consist of flat to gently dipping formations dominated by dolomite, sandstone, and limestone. The Cambrian rocks are mostly massive dolomite. From these formations, zinc, lead, and barium (tiff) ores were mined. These ore bodies occurred along the Big River and larger creeks in southern Jefferson County. Ordovician formations are exposed in three quarters of the County, including the St. Peter Sandstone, which is mined for glass. Ordovician limestone and dolomite are quarried for building stones, aggregate, and cement. Devonian formations consist of a narrow band of sandstones, shale, and limestone in the northeastern part of the County. Mississippian formations are predominantly limestone and cherty limestone, such as the Burlington/Keokuk. Pennsylvanian formations consist of sandstones and shales, often found in karst features such as sinks and bedrock joints (USDA 2000).

Soil types are controlled by the underlying parent materials, including loess and rock residuum. Six general soil associations are found in Jefferson County, distinguished by the type of landscape produced and its suitability for general land use, such as agriculture. These associations include the Hanie-Tice-Waldron Association, the Sonsac-Useful-Moko Association, the Wrengart-Goss Association, the Menfro-Gasconade Association, the Minnith-Pevelly Association, and the Haymond-Freeburg-Horsecreek-Bloomsdale Association (USDA 2000). The areas they cover in the County are shown on the attached general soil map of Jefferson County (Appendix D).

The Haynie-Tice-Waldron Association soils are derived from Mississippi River alluvium and consist mostly of very thick (greater than 5 feet) silt loams, derived from Mississippi River alluvium. These soils cover 1 percent of the Jefferson County surveyed area and are found on flood plains. The Sonsac-Useful-Moko Association consists mostly of moderately thick gravelly silt loams and thick silt loams, derived from loess and residuum. These soils cover 58 percent of the surveyed area in Jefferson County and are found on narrow ridges, summits, and backslopes. The Wrengart-Goss Association includes very thick soils consisting of silt loams, clayey to gravelly and cobbly in texture, derived from loess and cherty limestone residuum. These soils cover 13 percent of the Jefferson County surveyed area and are found on



summits, narrow ridges, and upper backslopes. The Menfro-Gasconade Association includes very thick soils consisting of silt loam to clayey silt loam, derived from loess and residuum. These soils cover 5 percent of the Jefferson County surveyed area and are found on summits and upper and lower back slopes. The Minnith-Pevely Association consists mostly of moderately thick sandy and clayey loams derived from fine loamy residuum weathered from sandstone. These soils cover 8 percent of the Jefferson County surveyed area and are found on ridgetops and backslopes. The Haymond-Freeburg-Horsecreek-Bloomsdale Association consists mostly of very thick silt loams to fine, sandy silt loams derived from alluvium. These soils cover 15 percent of the Jefferson County surveyed area and are found on flood plains and terraces. Soils covering most of the mining sites in southwest Jefferson County consist mostly of the Sonsac-Useful-Moko Association and the Wrengart-Goss Association (USDA 2000), as can be seen in the general soil map of Jefferson County (Appendix D).

## **2.3 HISTORY**

Mining activities in Jefferson County began in the early 1800s in southern Jefferson County, where the Cambrian dolomite source rock is concentrated along Big River and other major streams. The first production operation was a lead shot tower erected in 1809 in the southern part of Herculanum (USDA 2000). Two mines were in operation as early as 1818: Gray's mine was located on Big River and McKane's mine was located on Dry Creek. Many other mines were opened in the 1830s and 1840s for the production of lead, zinc, and barium (tiff). By 1855, three smelters were operating in Jefferson County, including Valles Mines, Mammoth Mines, and Sandy Mines. Historical records indicate that over three million pounds of lead was shipped out of Jefferson County annually during this time period, making it one of the leading lead producers (Goodspeed Publishing Company [Goodspeed] 1888).

The IMOP database lists 253 historical sites associated with mining and production operations in Jefferson County (MDNR 2005a). Of these, 202 of the mining sites were designated for lead or lead and other commodities, particularly zinc and barium (tiff). Most of the remaining sites were exclusively tiff mines. Past mining operators in Jefferson County included the St. Joe Lead Company (now Doe Run), the Valle Mining Company, the Big River Lead Company, Del Stocking, Magnolia Mining & Milling Company, Sandy Mining Company, National Lead Company, Bennett Lead & Zinc Company, Walther Mining Company, Ed Dixon, Big River L.M., M. & Development Company, and Iva Schmitz-Rome & John. Of these operators, Doe Run is the only mining operator currently listed in Jefferson County. Doe Run's smelter was opened in 1892 by their predecessor, the St. Joe Lead Company. In 2003, the Doe Run smelter was producing over 100,000 tons of lead a year (Doe Run 2004). The Valle Mining company is also still in existence, but no longer mines for lead. Presently, it owns 4,500 acres and operates a tree farm



and reclamation area over a portion of the former mining property. According to historical records, the company operated the lead mine and smelting operation at Valles Mines from approximately 1824 through the 1930s. The ruins of several ore milling structures, a former smelter, chat piles, and mill wastes are still present in the vicinity of Valle Mines (MDNR 2005b).

Past barium (tiff) producers in Jefferson County included Dresser Minerals, General Barite Company, Desoto Mining Company, and Scott & Whaley. Dresser Minerals was the largest producer of barium, and according to local residences, moved its operations overseas in the 1970s. Historical records indicate the earliest tiff mines started operating in the 1830s, and ceased circa 1975 (MDNR 2005a). Dresser Minerals is the only known tiff mining operator still in business in Jefferson County. It is now known as Dresser, Inc., (Formerly Dresser Industries) and has eliminated its mining division. It is currently 90-percent owned by First Reserve Corporation, a U.S. investment company (Wikipedia, 2007).

## **2.4 PREVIOUS INVESTIGATIONS AND WASTE CHARACTERISTICS**

Previous investigations in Jefferson County have been focused on the greater Herculanum area and in Valle Mines. The ongoing PRP lead removal action in Herculanum is outside the scope of this investigation, and will not be addressed in this report.

MDNR conducted an integrated Preliminary Assessment/Site Inspection/Removal Assessment (PA/SI/RA) at the Valles Mines Company site in Jefferson County, Missouri, from January to May 2004. The scope of the PA/SI/RA was to evaluate and document Hazard Ranking System (HRS) scoring factors based on a review of available files and analytical data from sampling mining waste and the surrounding environmental media. During this investigation, MDNR sampled surface water and sediment samples in creeks near, upstream, and downstream of identified source areas, and surface soil from six residential yards. In addition, MDNR collected a groundwater sample from a well 1,000 feet northwest of a former smelter operation, reviewed data from an on-site monitoring well that had been sampled during a previous investigation conducted in 2002, and reviewed monitoring data from the Valles Lake, Inc., #2 public supply well located 1.25 miles northwest of the site. The analytical results indicated a release of mining related contamination from the site to surface water and sediment, but no release to groundwater. In addition, according to the x-ray fluorescence (XRF) screening, two of the residential properties contained concentrations of lead exceeding its non-time-critical action level of 400 milligrams per kilogram (mg/kg). Laboratory confirmation of one of those samples indicated a lead concentration exceeding its time-critical action level of 1,200 mg/kg (MDNR 2005b).



### **3.0 CURRENT INVESTIGATION ACTIVITIES**

#### **3.1 SITE RECONNAISSANCE**

A site reconnaissance was conducted by START at 252 potential mining sites in Jefferson County, as identified by the IMOP database (see Appendix B, Figure 1); these are identified in Appendix A, Table 1. The reconnaissance consisted of a drive-by visual observation and photographic documentation of the mining site (Appendix E), and, where possible, in-situ screening using the NITON® XRF. Verbal access was acquired as needed for properties during the site reconnaissance. Upon completion of the reconnaissance, START confirmed that the most impacted area of Jefferson County was in its southwest quadrant, as suggested by the IMOP database. Further investigative needs were based upon one or more of the following criteria:

- Visible tailings or other evidences of mining activities were present.
- In-situ screening indicated elevated lead concentrations in the surface soil.
- Residential properties were located nearby a former mining operation, based on field judgment.
- Interviews with local residents indicated former mining activities in the area.

After the study areas were defined, START attempted to gain verbal access to the properties and residences by contacting the property owners. If the occupant was renting the property, the owner was contacted by telephone. Properties were sampled after access was granted.

#### **3.2 SOIL AND SEDIMENT SAMPLING**

Observed chat piles and tailings identified at former mining sites were sampled following procedures for sampling waste piles (EPA Standard Operation Procedure [SOP] 4231.217) as defined in the Quality Assurance Project Plan for the Jefferson County Lead Site in Jefferson County, Missouri, approved by EPA on July 11, 2006 (EPA 1994, Tetra Tech 2006). The SOP calls for samples consisting of 10-aliquot composites collected with a stainless steel spoon or scoop. In addition to collecting chat and tailings samples, samples were also collected along the shoulders of roads that were likely routes for hauling mining commodities, especially Engledow Road where mining activities ceased as recently as 1975. Residential soils were sampled by dividing the property into sampling cells no larger than 100 feet by 100 feet. Sensitive areas, such as playgrounds and gardens, were sampled separately. If gravel was present in the driveway or parking area, the driveway was sampled as a separate cell. The entire property was visually inspected for evidence of mining activities and samples were taken where such activity was



suspected. Moreover, a school property was sampled using the same methodology. At each cell, nine-*aliquot* soil samples were collected following standard procedures. All samples were collected by placing the material directly into a labeled, gallon-size, zip-loc bag with the sampling implement, usually a steel scoop. The sampling locations are shown in Appendix B on Figures 1, 2, 3, 4, and 5.

In like manner, sediment from surface drainage pathways was sampled at major creeks and streams near, upstream, and downstream from the mining sites according to field judgment. The drainage pathways included Big River, Calico Creek, Tiff Creek, and Joachim Creek. The sediment sampling locations are shown in Appendix B, Figure 5.

All soil and sediment samples were placed in aluminum pie pans, allowed to dry, then sieved and homogenized. The homogenized sample was screened with the XRF for lead. Three readings were taken of each sample collected, and these readings were averaged. The property information and XRF results were recorded on the residential property screening sheets (Appendix F). The residents were informed of the average XRF reading, and that reading was used for decision making to determine if a removal action was necessary. The XRF data was downloaded into a computer at the end of each day and stored in dated file folders for reference and quality control. Ten percent of the samples screened were submitted to the Region 7 EPA laboratory in Kansas City for analyses of arsenic, barium, cadmium, lead, nickel, and zinc (see Appendix G).

### **3.3 GROUNDWATER SAMPLING**

Residences in Jefferson County generally obtain their drinking water from private shallow drinking water wells (ranging from 50 to 500 feet deep), but in some communities, particularly Festus, water is supplied from deep community wells. START collected groundwater only from private drinking water wells. A total of 106 groundwater samples were collected from private drinking water wells. The supply lines were purged for 5 to 10 minutes before the samples were collected. Samples were then collected directly into a 1-liter cubitainer. Well depth, presence and type of treatment system, sampling location, and property owner information were recorded on the field screening sheets. The samples were preserved with nitric acid, and submitted in iced coolers to the EPA Region 7 laboratory for analyses of arsenic, barium, cadmium, lead, nickel, and zinc (see Appendix G).



### **3.4 SURFACE WATER SAMPLES**

Surface water samples were collected from major streams and creeks where the sediment samples were collected. In addition, several private ponds were sampled at locations based on an observed release from mining activities by direct observation. These samples were collected by dipping a 1-liter cubitainer directly into the water, and then preserving the sample with nitric acid. The surface water samples were analyzed for the same parameters as the groundwater samples.

## **4.0 DATA SUMMARY**

All the XRF screening and laboratory results for cadmium and lead are summarized in Appendix A, Table 2. The laboratory analytical data packages are provided in Appendix G. The XRF and laboratory data are discussed below.

### **4.1 SOIL AND SEDIMENT SAMPLES**

XRF screening of the soil and sediment samples collected at former mining sites and potential impact areas, including residential properties, indicated a significant impact on environmental media from historical mining activities. Of the 125 residential and school yards sampled, nine of the samples contained concentrations of lead in the soils greater than the primary, time-critical removal action of 1,200 parts per million (ppm), and 21 of the soil samples contained concentrations of lead greater than the secondary removal action of 400 ppm (EPA 2003). According to the sampling data, the school property was not impacted by historical mining activities. Of the nine source areas sampled, three of the source areas contained concentrations of lead greater than 1,200 ppm, with values ranging from 1,147 ppm to 7,070 ppm. Three other source areas contained concentrations of lead exceeding 400 ppm but less than 1,200 ppm, with concentrations ranging from 442 to 1,070 ppm. Five of the six source areas with identified elevated lead concentrations are located on residential properties. Impacted residential locations are shown in Appendix B, Figures 2 and 3.

Four soil samples were collected along the shoulders of a road near mining areas, as shown in Appendix B, Figure 5. The sample collected near Calico Creek where lead mining was documented had lead concentrations of 366 ppm and 528 ppm. These results suggest a minor impact from mining activities on Calico Creek. The samples collected along Engledow Road, where tuff mining was prevalent, had concentrations of lead less than 200 ppm, suggesting no significant impact from the historical mining operations.



START took composite samples of sediment from eight drainageways near the study areas (see Appendix B, Figure 3). Four of the samples contained concentrations of lead significantly above background readings, ranging from 330 to 742 ppm. These results suggest a minor impact from mining activities on the Big River. No other drainageways were impacted.

A statistical comparison of XRF readings with corresponding laboratory results for split samples resulted in a regression coefficient ( $r^2$ ) of 0.97 for the two sets of lead data from this investigation. This exceeds a coefficient value of 0.7 required to consider the remaining XRF readings as valid screening level data.

## **4.2 GROUNDWATER SAMPLES**

A total of 106 private drinking water wells were sampled in the study areas. All the groundwater results are shown in Appendix A, Table 2. Analytical results indicated that 13 of the sampled wells have been impacted by prior mining activities. Twelve of the wells contained concentrations of lead greater than the action level of 15 micrograms per Liter ( $\mu\text{g/L}$ ). The concentrations of lead ranged from 15.7  $\mu\text{g/L}$  to 71.8  $\mu\text{g/L}$ . Cadmium was identified at a concentration of 5.7  $\mu\text{g/L}$  in one of the other wells sampled, which exceeds its Maximum Contaminant Level (MCL) of 5  $\mu\text{g/L}$ . The locations of impacted private drinking water wells are shown in Appendix B, Figure 4.

## **4.3 SURFACE WATER SAMPLES**

Surface water samples were collected concurrently with the sediment samples from the drainageways and from a few private ponds near mining sites. Analytical results indicated that the samples collected in Big River contained concentrations of lead ranging from 17.8  $\mu\text{g/L}$  to 48  $\mu\text{g/L}$ . The surface water results correlate with the sediment sample results. The analytical results from the surface water samples from the other drainageways indicate no impact from historical mining activities. Pond water from six residential properties were also sampled. Three of the ponds samples contained concentrations of lead ranging from 21.2  $\mu\text{g/L}$  to 29.7  $\mu\text{g/L}$ . These three ponds were all close to source areas.

# **5.0 SUMMARY AND CONCLUSIONS**

## **5.1 PRE-REMEDIAL CONSIDERATIONS**

The Pre-CERCLIS SSA conducted by START identified elevated levels of lead exceeding the primary and secondary action levels for removal action of 1,200 ppm and 400 ppm, respectively. Elevated concentrations of lead were found in 12 private drinking water wells, and an elevated concentration of cadmium was found in one additional well. Additionally, the investigation indicated that major surface



water pathways have been impacted from prior historical mining operations. These results warrant further assessment activities to fully identify the extent of contamination. Pre-remedial issues are summarized in a Region 7 Superfund Site Pre-CERCLIS Screening Form included as Appendix H.

## **5.2 REMOVAL CONSIDERATIONS**

Because lead concentrations in nine residential yards exceed the primary removal action of 1,200 ppm, and 13 private wells have been identified with elevated lead and cadmium concentrations, a time-critical removal action is warranted. However, because of the limited scope of the screening investigation, further sampling of private wells and residential soils, especially where elevated blood levels in children have been identified, is needed to fully assess the extent of the removal action. The ongoing investigation can be performed concurrent with removal action activities. This investigation should include further assessment of the Valle Mines area because the MDNR investigation was limited and did show that the area has been impacted.



## 6.0 REFERENCES

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**APPENDIX A**  
**TABLES**



Table 1: Historical Mining Site Information from IMOP Database  
Jefferson County Lead Site

| IMOP ID# | EPA ID#            | LATITUDE  | LONGITUDE  | QUAD        | PROPER NAME  | TYPE OPERATION                    | STATUS        | COMMODITY  | OWNER   | OPERATOR   | ACRES | DEPTH | OPENED | CLOSED | RE-OPENED | RE-CLOSED | COMMENT   | ADDITIONAL COMMENTS   |
|----------|--------------------|-----------|------------|-------------|--|-----------------------------------|---------------|--|---|--|-------|-------|--------|--------|-----------|-----------|---|---|
| 0990004  |                    | 38.026389 | -90.59194  | Vineland    | Blackwell Mine & Washer  | Surface                           | Past Producer | Barium   | General Barite Company                                  | General Barite Company   |       |       |        |        |           |           | not on 208 map, no sheet, mislocated?   |   |
| 0990006  |                    | 38.260833 | -90.37666  | Herculaneum | Herculaneum Smelter  | Smelter                           | Producer      | Lead   | ST JOE LEAD CO  | ST JOE LEAD CO   |       |       |        |        |           |           | loc changed per topo cms  | Field checked by Ken Searcy 5-2-1979.   |
| 0990010  |                    | 38.120556 | -90.69555  | Tiff        | Dresser Minerals Pit #11; Mine No. 11  | Surface                           | Past Producer | Barium   | Dresser Minerals  | Dresser Minerals   | 70    |       |        |        |           |           |   |   |
| 0990011  |                    | 38.019722 | -90.60777  | Vineland    | Dresser Minerals Mill #10  | Plant                             | Past Producer | Barium   | Dresser Minerals  | Dresser Minerals   | 6     |       |        |        |           |           |   | Same as Blackwell washer?   |
| 0990028  |                    | 38.111111 | -90.6675   | Tiff        | Dresser Minerals Plant #11   | Plant                             | Past Producer | Barium   | Dresser Minerals  |  |       |       |        |        |           |           |   |   |
| 0990031  |                    | 38.120556 | -90.69555  | Tiff        | Dresser Minerals Plant #11   | Plant                             | Past Producer | Barium   | Dresser Minerals  | Dresser Minerals   |       |       |        |        |           |           |   |   |
| 0990047  |                    | 38.019722 | -90.60777  | Vineland    | Dresser Minerals Mine #10  | Surface                           | Past Producer | Barium   | Dresser Minerals  | Dresser Minerals   | 127   |       |        |        |           |           |   |   |
| 0990048  |                    | 38.165278 | -90.73472  | Fletcher    | Fletcher Property  |                                   | Prospect      | Barium   | Dresser Minerals  |  |       |       |        |        |           |           |   |   |
| 0990049  | SW-0027<br>SW-0028 | 38.010278 | -90.58305  | Vineland    | Dresser Mine #10   | Surface                           | Past Producer | Barium   | Dresser Minerals  | Dresser Minerals   |       |       |        |        |           |           | duplicate of 0990047? UTM changed per KS, plotted in 17, actually in 17 at UTM of 4210500 710000?cms  |   |
| 0990050  |                    | 38.12     | -90.69722  | Tiff        | Dresser Mine #11   | Surface                           | Past Producer | Barium   | Dresser Minerals  | Dresser Minerals   |       |       |        |        |           |           | duplicate of 0990050?   |   |
| 0990051  |                    | 38.066667 | -90.60888  | Vineland    | A.E. Stocking Mine   | Surface                           | Past Producer | Barium   | C.P. De Lore  |  |       |       |        |        |           |           |   | Not seen on photo. No reference on card.  |
| 0990054  |                    | 38.2375   | -90.45388  | Festus      | Bailey Mines   | Surface                           | Past Producer | Lead   |   |  |       |       |        |        |           |           |   | Not seen on photo.  |
| 0990055  |                    | 38.021111 | -90.51777  | Vineland    | Bisch & Daly's Mines; Bisch & Daly   | Surface                           | Past Producer | Lead   |   |  |       | 80    |        |        |           |           |   | Not seen on photo.  |
| 0990056  |                    | 38.016111 | -90.53944  | Vineland    | Bogy's Diggings  | Surface                           | Past Producer | Lead; Zinc   |   |  | 0.13  |       |        |        |           |           | Broadhead 1873 yielded considerable Pb, not worked for several yrs.   | Pit visible on USGS photo.  |
| 0990057  |                    | 38.046378 | -90.608523 | Vineland    | Campbell Mine  | Surface                           | Past Producer | Lead; Zinc   |   | VALLE MINING CO  |       |       |        |        |           |           |   | Not seen on photo.  |
| 0990058  |                    | 38.036944 | -90.50277  | Vineland    | Corn Stalk Diggings  | Surface;<br>Underground           | Past Producer | Lead; Zinc   |   |  | 0.75  | 30    |        |        |           |           | Winslow 1894 shallow pits, 14 openings in area <15 ac.  | 14 Shafts. Associated with barite and red clay. "Fourteen openings had been sunk." Several waste piles visible on 1937 photo. |
| 0990059  |                    | 38.191944 | -90.70972  | Fletcher    | Darby Diggings; Old Darby Diggings   | Surface;<br>Underground;<br>Mill  | Past Producer | Lead; Barium   | Henry Hammell & sister                                  | Big River Lead Company;<br>Dixon   |       | 100   |        |        | 1929      |           | St. Clair 566 extensive but shallow. Kidwell 1946 mill only ran few weeks, much Pb and Ba removed.  | Not seen on photo.  |
| 0990063  |                    | 38.201111 | -90.75638  | Richwoods   | Ditch Mine   | Surface;<br>Underground;<br>Mill  | Past Producer | Lead; Zinc;<br>Barium  |   | Del Stocking   | 0.25  | 110   |        | 1906   |           |           | Kidwell 1946 Joplin-type mill on Ditch Creek 400' NW of cut.  | Shaft. Galena, barite, calcite, sphalerite, limonite present. Dump area visible on photo.                                     |
| 0990064  |                    | 38.1925   | -90.755    | Richwoods   | Ditch Lead Mines   | Underground;<br>Mill              | Past Producer | Lead; Barium;<br>Zinc  |   | Del Stocking   |       |       |        |        | 1906      |           | Grohskopf 1933 another site 0.5 mi downstream. Joplin-type mill on site.  | Shaft. Barite, calcite, galena, sphalerite occur as veins filling fractures in Eminence Dolomite. Not seen on photo.          |
| 0990065  |                    | 38.036389 | -90.53527  | Vineland    | Fletcher Washer Mine   | Surface                           | Past Producer | Lead; Zinc   |   | VALLE MINING CO  |       |       |        |        |           |           |   | Not seen on photo.  |
| 0990066  |                    | 38.023611 | -90.54527  | Vineland    | Frank Appleberry Mine  | Surface                           | Past Producer | Lead   | VALLE MINING CO   | VALLE MINING CO  | 0.5   |       |        |        |           |           |   | Shaft. Area 1 on topo. Waste area visible on all photos, shaft not seen.  |
| 0990068  |                    | 38.172222 | -90.73833  | Fletcher    | Frissel's Mines  | Surface                           | Past Producer | Lead; Barium?  |   |  |       |       | 1842   |        |           |           | Broadhead 1873 not much worked for several yrs, Ba on Frissel's land but in SW 28.  | Not seen on photo.  |
| 0990069  |                    | 38.158611 | -90.69416  | Fletcher    | Frumet Mines; No. 1 Shaft; No. 2 Shaft; Bluff Shaft; Tausig Track Mine; Taisog Trod Mine | Surface;<br>Underground;<br>Plant | Past Producer | Lead; Zinc-<br>carbonate;<br>Barium;<br>Fluorine; Zinc-<br>sulfide | G W TAUSSIG; Paussig estate; Puassig estate; Roy Wagnon | Johnson & Son; Johnson-Oldani Mining Company; Lou Oldani; Frumet Mining Company; Mersual & Allee; Mersual-Allee Timber Company; Merseal-Allen Timber Company; Johnston Oldani Mining Company | 2     | 85    | 1859?  | 1890?  | 1942      |           | also reopened 1945. split mines?use Winslow 1894. Kidwell 1946 reworking of dumps, several shafts. MR file Clark found fluorite on dumps, Johnson in 1942 stopped producing Zn-carb because of fluorine content/smelter penalty. Msc 25019 4 tons Pb daily. | Shallow cuts and diggings. Several dumps visible on both photos.  |
| 0990070  |                    | 38.032222 | -90.53083  | Vineland    | Garatee Mines; Garratee Diggings   | Underground                       | Past Producer | Lead; Zinc-<br>carbonate;<br>Barium                                |   |  |       | 135   |        |        |           |           | Kidwell 1946 6 shafts, all connected. SMI 1892 8 shafts.  | Several shafts. Ore associated with barite and red clay. Not seen on photo.   |
| 0990071  |                    | 38.021944 | -90.54333  | Vineland    | Garraty Mines  | Underground                       | Past Producer | Lead; Zinc   | VALLE MINING CO   | VALLE MINING CO  | 1.5   |       |        |        |           |           |   | Garraty shafts 3 & 4, area #3 on topo. Both shafts visible on USGS photo. 1/8 ac shafts, 1 3/8 ac waste piles.                |
| 0990072  |                    | 38.024722 | -90.54416  | Vineland    | Garraty Mines  | Underground                       | Past Producer | Lead; Zinc   | VALLE MINING CO   | VALLE MINING CO;<br>Fredericktown Lead Company   | 1.25  |       |        |        |           |           | 208 map 38 ac of surface disturbance, Fredericktown Lead Company.   | Garraty shafts 1, 2, 5 & 6. 1/8 ac shafts, 1 1/8 ac waste piles. All 4 shafts visible on USGS photo.                          |
| 0990073  |                    | 38.029444 | -90.50666  | Vineland    | Garrity Mines  | Surface                           | Past Producer | Lead   |   |  |       |       |        |        |           |           |   | Not seen on photo.  |



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Jefferson County Lead Site

| IMOP ID# | EPA ID# | LATITUDE  | LONGITUDE | QUAD                 | PROPER NAME  | TYPE OPERATION                      | STATUS        | COMMODITY   | OWNER  | OPERATOR   | ACRES | DEPTH | OPENED          | CLOSED | RE-OPENED | RE-CLOSED | COMMENT  | ADDITIONAL COMMENTS  |
|----------|---------|-----------|-----------|----------------------|--|-------------------------------------|---------------|---|--|--|-------|-------|-----------------|--------|-----------|-----------|--|--|
| 0990074  |         | 38.024444 | -90.53583 | Vineland             | Garrity & Butcher's Diggings; Butcher's Diggings                         | Underground                         | Past Producer | Lead  | VALLE MINING CO  | VALLE MINING CO                                    |       |       |                 |        |           |           | Broadhead 1873 site not worked for some yrs.   | Not seen on photo.   |
| 0990077  |         | 38.148889 | -90.68583 | Fletcher             | Gray's Diggings  | Surface                             | Past Producer | Zinc; Barium  |  |  |       |       |                 | 1830   |           |           |  | Along Grey's Branch of the Big River. Not seen on photo.                     |
| 0990078  |         | 38.148611 | -90.7     | Fletcher             | Gray's Mines   | Surface;<br>Underground;<br>Smelter | Past Producer | Zinc; Lead  |  |  |       |       | late 1810s?     |        |           |           | Broadhead 1873 few shafts most from surface mines, ore formerly smelted at site (log furnace).   | Not seen on photo.   |
| 0990080  |         | 38.239722 | -90.48888 | Festus               | Herculaneum Mines; Gopher Mines; Herculaneum Minining Company's Diggings | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           |  | Not seen on photo.   |
| 0990081  |         | 38.143333 | -90.35777 | Selma                | How's Mines; Howe's Diggings; How's Diggings; How's Lead Mines           | Surface                             | Past Producer | Lead; Zinc; Barium  |  |  |       |       | 1840            |        |           |           | Broadhead 1873 smelted at Sandy Mines  | Shallow digs. Not seen on photo.   |
| 0990082  |         | 38.113889 | -90.56916 | Vineland             | Hunt's Mines   | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           |  | Not seen on photo.   |
| 0990083  |         | 38.131944 | -90.61138 | De Soto              | Kelly's Diggings   | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           | Broadhead 1873 yielded considerable Pb.  | Not seen on photo.   |
| 0990084  |         | 38.111944 | -90.65388 | Tiff                 | Lee's Diggings; Lee Mines  | Surface;<br>Underground             | Past Producer | Lead; Zinc; Barium  |  |  |       | 150   |                 |        |           |           | Broadhead 1873 worked about 20 yrs ago. St. Clair surface and underground.   | Shaft. Barite and pyrite also present. Photo - not seen, wooded.             |
| 0990086  |         | 38.133056 | -90.655   | Fletcher             | Mammoth Mine; Mammoth Diggings; Mammoth Lead Mines                       | Underground;<br>Mill                | Past Producer | Lead; Clay; Zinc-sulfide; Zinc-carbonate; Barium; Iron-sulfide; Iron-hematite | J.J. Broderick; Broderick Rope Company   |  |       | 80    | 1843            | 1852   |           | 1890      | Poston 1937 several shafts & a tunnel, worked intermittently since Civil War. Kidwell 1946 mill at S shaft. Litton 1855 2 shafts, no operations since 1852. MR file dumps 25x100x15, 75x75x20.                       | Barite, marcasite, sphalerite present also. Not seen in photo.               |
| 0990089  |         | 38.240556 | -90.435   | Festus               | McClenahan's Mines   | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           |  | Not seen on photo.   |
| 0990090  |         | 38.113611 | -90.40972 | Halifax              | McCormick Mines; McCormick's Diggings; McCormicks Lead Mine              | Underground                         | Past Producer | Lead; Zinc  |  |  |       | 200   | 1824            | 1875   |           |           | Broadhead 1873 number of shafts some more than 30 yrs old.   | Pyrite also present. Not seen on photo.                                      |
| 0990091  |         | 38.109167 | -90.34944 | Danby                | Mead's Mines   | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           |  | Not seen on photo.   |
| 0990092  |         | 38.029444 | -90.50027 | Vineland;<br>Halifax | Miller Mine  | Surface                             | Past Producer | Zinc; Lead  | VALLE MINING CO  | VALLE MINING CO                                    | 23    |       |                 |        |           |           |  | Large elongate "strip" area seen on 1966 photo.                              |
| 0990093  |         | 38.035    | -90.49138 | Halifax              | Miller's Diggings  | Surface                             | Past Producer | Lead  | VALLE MINING CO  | VALLE MINING CO                                    |       |       |                 |        |           |           |  | Not seen on photo.   |
| 0990094  |         | 38.272778 | -90.6625  | Cedar Hill           | Morse Mine   | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           | point A on MILS topo?cms   | Not seen on photo.   |
| 0990095  |         | 38.170556 | -90.70361 | Fletcher             | Nashville Mines; Nashville Lead Mines                                    | Surface                             | Past Producer | Lead  |  |  | 0.25  |       | 1827            |        |           |           |  | 2 waste piles seen on 1937 photo.  |
| 0990099  |         | 38.2      | -90.65583 | Fletcher             | Quinn Mine   | Underground                         | Past Producer | Lead; Barium  |  |  |       |       |                 |        |           |           | St. Clair 566 tons but call them "a statement of doubt."   | Ore fills fractures in dolomite. Not seen on photo.                          |
| 0990100  |         | 38.289722 | -90.50416 | Belew Creek          | Sandy Mines; Sandy Diggings; Sandy Lead Mine                             | Underground                         | Past Producer | Lead; Zinc; Barium  | E. Maysenburg, Dr. Park, W. Voughton, G.J. Johnson, J.G. Warne; E. Myersburg & Dr. W. Park | MAGNOLIA MINING & MILLING CO; Sandy Mining Company |       | 130   | 1824            |        |           |           | Msc 25013 upward of 100 shafts on this vein. Stromme 1907 operated at intervals last 6 yrs. Litton 1855 6 shafts named 1 thru 6, 2 levels, 115' deepest shaft in text, fig has one 152'+, opened no later than 1840. | Shafts. Not seen on photo.   |
| 0990101  |         | 38.257778 | -90.54333 | Belew Creek          | Sandy Mines  | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           |  | Not seen in photo.   |
| 0990102  |         | 38.188611 | -90.73194 | Fletcher             | Shady Diggings   | Surface                             | Past Producer | Lead; Barium  |  |  |       |       |                 |        |           |           | St. Clair NB 566 considerable Pb recovered.  | Not seen on photo.   |
| 0990104  |         | 38.094167 | -90.3125  | Danby                | Robbin's Lead Mine   | Surface                             | Past Producer | Lead; Barium  |  |  |       |       |                 |        |           |           | Winslow 1894 Pb not economic, 6 shafts.  | Not seen on photo.   |
| 0990105  |         | 38.101111 | -90.58833 | Vineland             | Robinson's Diggings  | Surface                             | Past Producer | Lead  | General Hunt   |  |       |       |                 |        |           |           |  | Not seen on photo.   |
| 0990106  |         | 38.032778 | -90.49277 | Halifax              | Rocky Digs Mines; Rocky Diggings   | Surface;<br>Furnace                 | Past Producer | Zinc-sulfide; Zinc-carbonate; Lead  | VALLE MINING CO  | VALLE MINING CO                                    | 1.25  |       |                 |        |           |           | Broadhead 1873 not worked for several yrs. Kidwell 1946 due E of old furnace.  | 3 waste areas visible on USGS photo.   |
| 0990107  | SW-0064 | 38.095556 | -90.58861 | Vineland             | Skewe's & Valle's Mine; Skewe's & Vally                                  | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           |  | Not seen on photo.   |
| 0990108  |         | 38.103333 | -90.6075  | Vineland             | Skewe's & Valle's Copper Mines   | Underground                         | Past Producer | Copper  | Dr. Cooley & Mr. Cross; SKEWE & VALLE  |  |       | 120   | 1844            | 1850   |           |           | Broadhead 1873 10-12 shafts, smelted at Mine La Motte.   | 10-12 shafts, 60-120' deep. Not seen on photo.                               |
| 0990109  |         | 38.025278 | -90.54888 | Vineland             | Tarpley Mines; Tarpley Mine's  | Underground                         | Past Producer | Lead; Zinc; Barium  |  |  |       | 180   | 1845 or earlier |        |           |           | Litton 1855 max depth of 180', avg 75-80', smelted at both White's and Perry's. Broadhead 1873 still operating 1856.   | 3 shafts. Associated with red clay. 3 mines in this area. Not seen on photo. |
| 0990110  | SW-0029 | 38.021944 | -90.55888 | Vineland             | Tyler & Poston Mines; Poston & Tyler's Mines; Poston & Tyler's           | Surface                             | Past Producer | Lead  |  |  |       |       |                 |        |           |           |  | Not seen on photo, area now occupied by Cole Landing Field.                  |
| 0990116  |         | 38.127778 | -90.40444 | Festus               | Yankee Diggings  | Surface                             | Past Producer | Lead; Zinc; Barium  |  |  |       | 70    |                 |        |           |           |  | Galena found with calcite, barite and pyrite. Not seen on photo.             |



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|----------|---------|-----------|------------|-------------|-------------------------|----------------|---------------|--------------|-------------------------|-----------------------------|-------|-------|--------|--------|-----------|-----------|--|---|
| 0990117  |         | 38.108333 | -90.61972  | Vineland    |                         | Surface        | Past Producer | Barium       |                         |                             | 14    |       |        |        |           |           |  | Strip area and pond, 11 ac waste piles, 3 ac tailings pond. Tailings pond and strip area visible on 1966 and 1954 photos. |
| 0990118  |         | 38.069444 | -90.58666  | Vineland    |                         | Surface        | Past Producer | Barium       |                         |                             | 8     |       |        |        |           |           | sheet - no reference on card cms.  | Shallow diggings. Many shallow diggings visible on 1954 photo.  |
| 0990119  |         | 38.065556 | -90.575    | Vineland    |                         | Surface        | Past Producer | Barium       |                         |                             | 55    |       |        |        |           |           |  | Shallow diggings. Numerous diggings seen on 1954 photo.   |
| 0990120  |         | 38.026389 | -90.52055  | Vineland    | Valle Mine; Valles Mine | Surface        | Past Producer | Barium       |                         |                             | 106   |       |        |        |           |           | 208 map merges 3 areas on topo. UTM changed per KS cms (original 4211425 717625) | Large strip area. Photo - about 25% reclaimed in northern portion.  |
| 0990121  |         | 38.169722 | -90.68361  | Fletcher    |                         | Surface; Plant | Past Producer | Barium; Lead |                         | National Lead Company       | 4     |       |        |        |           |           | Muilenberg 1944 plant under construction.  | Photo - waste piles and scraped land visible.   |
| 0990123  |         | 38.200278 | -90.55138  | De Soto     |                         | Surface        | Past Producer | Copper       |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990124  |         | 38.101667 | -90.60055  | Vineland    |                         | Surface        | Past Producer | Copper       |                         |                             | 0.13  |       |        |        |           |           |  | Small dump visible in 1937 photo, possible shaft (?) on 1954 photo.   |
| 0990128  |         | 38.0325   | -90.49972  | Halifax     |                         | Surface        | Past Producer | Lead         | VALLE MINING CO         | VALLE MINING CO             | 0.13  |       |        |        |           |           |  | Small waste area seen on 1937 photo.  |
| 0990129  |         | 38.015556 | -90.53388  | Vineland    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990130  |         | 38.015278 | -90.52916  | Vineland    |                         | Surface        | Past Producer | Lead         | VALLE MINING CO         | VALLE MINING CO             |       |       |        |        |           |           | UTM changed per KS cms (4210170 716900)  | Not seen on photo.  |
| 0990131  |         | 38.030278 | -90.55388  | Vineland    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           | UTM changed per KS cms (original 4211800 714700)                                 | Not seen on photo.  |
| 0990132  |         | 38.016389 | -90.5475   | Vineland    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990133  |         | 38.03     | -90.4975   | Halifax     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990134  |         | 38.039386 | -90.522459 | Vineland    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990135  |         | 38.11     | -90.6425   | Tiff        |                         | Underground    | Past Producer | Lead         |                         |                             | 2     |       |        |        |           |           |  | Shaft and waste area visible on 1966 photo  |
| 0990136  |         | 38.123889 | -90.67055  | Tiff        |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990137  |         | 38.124722 | -90.65444  | Tiff        | Lee Mine                | Surface        | Past Producer | Lead; Barium |                         | Bennett Lead & Zinc Company | 0.5   | 125   |        |        |           |           |  | Small waste area visible on photo.  |
| 0990138  |         | 38.123889 | -90.66138  | Tiff        |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           | UTM corrected.cms  | Not seen on photo.  |
| 0990139  |         | 38.128333 | -90.61     | De Soto     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990140  |         | 38.135556 | -90.58694  | De Soto     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990141  |         | 38.049444 | -90.47416  | Halifax     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen in photo.  |
| 0990142  |         | 38.049722 | -90.46944  | Halifax     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen in photo.  |
| 0990143  |         | 38.138889 | -90.33277  | Selma       |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990144  |         | 38.139167 | -90.35527  | Selma       |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990145  |         | 38.129444 | -90.34888  | Selma       |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990146  |         | 38.127778 | -90.40444  | Festus      |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990147  |         | 38.129722 | -90.36722  | Selma       |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990148  |         | 38.136667 | -90.36222  | Selma       |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990149  |         | 38.11     | -90.405    | Halifax     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990150  |         | 38.221389 | -90.67166  | Fletcher    |                         | Underground    | Past Producer | Lead         | Dr. George Elder's Farm |                             | 0.13  | 50    |        |        |           |           |  | Small waste area seen on 1966 photo.  |
| 0990151  |         | 38.231389 | -90.6625   | Fletcher    |                         | Surface        | Past Producer | Lead         |                         |                             | 0.06  |       |        |        |           |           |  | Slender pit on 1966 photo, small dump on 1937 photo.  |
| 0990152  |         | 38.184722 | -90.71861  | Fletcher    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990153  |         | 38.168889 | -90.72472  | Fletcher    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990154  |         | 38.170556 | -90.71805  | Fletcher    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990155  |         | 38.158333 | -90.72444  | Fletcher    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990156  |         | 38.231944 | -90.57888  | De Soto     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990157  |         | 38.176667 | -90.40916  | Festus      |                         | Surface        | Past Producer | Lead         |                         |                             | 0.13  |       |        |        |           |           |  | Small quarry visible.   |
| 0990158  |         | 38.1725   | -90.40583  | Festus      |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990159  |         | 38.247222 | -90.58027  | De Soto     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990160  |         | 38.241667 | -90.55083  | De Soto     |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990161  |         | 38.289722 | -90.51138  | Belew Creek |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990162  |         | 38.280278 | -90.50027  | Belew Creek |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990163  |         | 38.256111 | -90.43416  | Herculaneum |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen on photo.  |
| 0990164  |         | 38.267222 | -90.44805  | Herculaneum |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen in photo.  |
| 0990165  |         | 38.271389 | -90.50638  | Belew Creek |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  | Not seen in photo.  |
| 0990166  |         | 38.419722 | -90.39638  | Maxville    |                         | Surface        | Past Producer | Lead         |                         |                             |       |       |        |        |           |           |  |   |
| 0990167  |         | 38.205278 | -90.7525   | Richwoods   |                         | Surface        | Past Producer | Lead; Barium |                         |                             | 0.5   |       |        |        |           |           |  | Shallow diggings visible on photo.  |



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Jefferson County Lead Site

| IMOP ID# | EPA ID#            | LATITUDE  | LONGITUDE  | QUAD                  | PROPER NAME                      | TYPE OPERATION       | STATUS        | COMMODITY                   | OWNER                                     | OPERATOR              | ACRES | DEPTH | OPENED | CLOSED | RE-OPENED | RE-CLOSED | COMMENT   | ADDITIONAL COMMENTS  |
|----------|--------------------|-----------|------------|-----------------------|----------------------------------|----------------------|---------------|-----------------------------|---|-----------------------|-------|-------|--------|--------|-----------|-----------|---|--|
| 0990168  |                    | 38.028056 | -90.52527  | Vineland              |                                  | Surface              | Past Producer | Lead; Barium                |   |                       | 10    |       |        |        |           |           |   | Large "strip" area. Strip area seen on USGS photo, wooded on ASCS photo. |
| 0990169  |                    | 38.028056 | -90.4925   | Halifax               |                                  | Surface              | Past Producer | Lead; Zinc                  |   |                       |       |       |        |        |           |           |   | Not seen on photo.   |
| 0990170  |                    | 38.108611 | -90.50611  | Vineland              |                                  | Surface              | Past Producer | Lead; Zinc                  |   | VALLE MINING CO       |       |       |        |        |           |           |   | Not seen on photo.   |
| 0990171  |                    | 38.163889 | -90.68138  | Fletcher              |                                  | Surface              | Past Producer | Lead; Zinc                  |   |                       |       |       |        |        |           |           | loc changed per topo cms  | Not seen.  |
| 0990172  | JC-0132            | 38.155278 | -90.68333  | Fletcher              |                                  | Surface              | Past Producer | Lead; Zinc                  |   |                       |       |       |        |        |           |           |   | Not seen on photo.   |
| 0990173  |                    | 38.181667 | -90.45     | Festus                |                                  | Surface              | Past Producer | Lead; Zinc                  |   |                       |       |       |        |        |           |           |   | Not seen on photo.   |
| 0990183  | JC-0105            | 38.284444 | -90.51277  | Belew Creek           |                                  | Surface; Underground | Past Producer | Lead; Zinc; Barium          |   |                       | 0.13  |       |        |        |           |           | Sheet notes as limestone; David C. Smith (3/91) visited, notes on sheet that is probably Pb-Zn-Ba, abandoned shaft with many little shallow prospect holes. Sheet notes no reference on card. | 3 pits visible on 1968 photo.  |
| 0990219  |                    | 38.148611 | -90.69055  | Fletcher              |                                  | Surface              | Past Producer | Zinc; Lead                  |   |                       |       |       |        |        |           |           |   | Not seen on photo.   |
| 0990229  |                    | 38.019854 | -90.517912 | Vineland              | Big Lode, Valle's Mine           | Underground          | Past Producer | Lead                        | Valle Mines                               |                       |       | 115   | 1824   |        |           |           | Probably became other mines in section.   |  |
| 0990231  |                    | 38.241551 | -90.453745 | Festus                | Plattin Digings, Howe's Diggings | Underground          | Past Producer | Lead                        |   |                       |       |       |        |        |           |           |   |  |
| 0990232  |                    | 38.025418 | -90.524524 | Vineland              | Valle Mine Tailings Pond         | Tailings Pond        | Past Producer | Barium                      |   |                       | 40    |       |        |        |           |           | Msc 20779 1975 ac est.  |  |
| 0990233  |                    | 38.105779 | -90.628049 | Vineland or Tiff      |                                  | Tailings Pond        | Past Producer | Barium                      |   |                       | 15    |       |        |        |           |           | Msc 20779 1975 ac est.  |  |
| 0990234  |                    | 38.029976 | -90.521888 | Vineland              | Valle Mine Tailings Pond         | Tailings Pond        | Past Producer | Barium                      |   |                       | 10    |       |        |        |           |           | Msc 20779 ac est.   |  |
| 0990235  |                    | 38.190330 | -90.754011 | Richwoods             | Twin Barite Mine Tailings Pond   | Tailings Pond        | Past Producer | Barium                      |   | Desoto Mining Company | 90    |       |        |        |           |           | 208 map mostly in W2 of section   |  |
| 0990236  |                    | 38.017070 | -90.609192 | Vineland              | Dresser Mill #10 Tailings Pond   | Tailings Pond        | Past Producer | Barium                      |   | Dresser Minerals      | 25    | 50    | 1975?  |        |           |           | Msc 20779 ac is min, new.   |  |
| 0990237  |                    | 38.059024 | -90.575279 | Vineland              |                                  | Surface              | Past Producer | Barium                      |   |                       | 69    |       |        |        |           |           |   |  |
| 0990238  |                    | 38.055265 | -90.559552 | Vineland              |                                  | Surface              | Past Producer | Barium                      |   |                       | 29    |       |        |        |           |           |   |  |
| 0990239  |                    | 38.055810 | -90.552388 | Vineland              |                                  | Surface              | Past Producer | Barium                      |   |                       | 14    |       |        |        |           |           |   |  |
| 0990240  | JC-0027<br>JC-0028 | 38.014462 | -90.580860 | Vineland              |                                  | Surface              | Past Producer | Barium                      |   |                       | 40    |       |        |        |           |           |   |  |
| 0990241  |                    | 38.279503 | -90.662710 | Cedar Hill            |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | no elev 1 qtr cms   |  |
| 0990242  |                    | 38.289193 | -90.508829 | Belew Creek           |                                  | Furnace              | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | no elev 1 qtr cms   |  |
| 0990243  |                    | 38.252941 | -90.549775 | Belew Creek           |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | May be same site as Sandy Mines in same section in IMOP.  |  |
| 0990244  |                    | 38.265440 | -90.441414 | Herculaneum           |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           |   |  |
| 0990245  |                    | 38.265283 | -90.422289 | Herculaneum           |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           |   |  |
| 0990246  |                    | 38.256823 | -90.429741 | Herculaneum           | Rankin's Mines                   |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           |   |  |
| 0990247  |                    | 38.251284 | -90.441820 | Herculaneum or Festus |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           |   |  |
| 0990248  |                    | 38.236605 | -90.484682 | Festus                |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | May be 0990080.   |  |
| 0990249  |                    | 38.235923 | -90.460533 | Festus                |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | May be 0990054 or 0990231.  |  |
| 0990250  |                    | 38.236349 | -90.446993 | Festus                |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | May be 0990054 or 0990231.  |  |
| 0990251  |                    | 38.162296 | -90.703709 | Fletcher              | Nashville Lead Mines             |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           |   |  |
| 0990252  |                    | 38.177052 | -90.403966 | Festus                |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | no elev 1 qtr cms   |  |
| 0990253  |                    | 38.106952 | -90.404501 | Halifax               |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | May be same as site in same section with no quarter sec.  |  |
| 0990254  |                    | 38.130873 | -90.377622 | Festus                |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | long section, qtrs too vague for loc.cms  |  |
| 0990255  |                    | 38.104964 | -90.326335 | Danby                 |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | May be same as site in same section with no quarter sec. No attempt at elev 1 qtr cms   |  |
| 0990256  | JC-0029            | 38.028715 | -90.554179 | Vineland              |                                  |                      | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | May be other site in this section (0990131).  |  |
| 0990259  |                    | 38.174688 | -90.692351 | Fletcher              |                                  | Underground          | Past Producer | Zinc; Lead                  |   |                       |       |       |        |        |           |           | St. Clair 566 deep shaft.   |  |
| 0990260  |                    | 38.174354 | -90.711617 | Fletcher              | North Cut Mine                   | Underground          | Past Producer | Zinc; Lead                  |   |                       |       |       |        |        |           |           | St. Clair 566 mill nearby.  |  |
| 0990261  |                    | 38.218592 | -90.673284 | Fletcher              |                                  | Surface              | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | St. Clair considerable Pb mined.  |  |
| 0990262  |                    | 38.214922 | -90.657286 | Fletcher              |                                  | Surface?             | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | St. Clair E of schoolhouse at Ware.   |  |
| 0990263  |                    | 38.189881 | -90.700594 | Fletcher              |                                  | Surface?             | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | St. Clair above house owned by Mr. Huskey, quite extensive diggings.s   |  |
| 0990264  |                    | 38.204159 | -90.700852 | Fletcher              | Knapp Diggings                   | Surface?             | Past Producer | Lead                        |   |                       |       |       |        |        |           |           | no elev 1 qtr cms   |  |
| 0990266  |                    | 38.189517 | -90.746878 | Fletcher              |                                  | Underground          | Past Producer | Lead; Barium                |   |                       |       |       |        |        |           |           |   |  |
| 0990275  |                    | 38.216465 | -90.771208 | Richwoods             | Old Ditch Mine?                  |                      | Past Producer | Lead; Barium                | George S. Price; Homer V. Price & Company | Stocking              |       |       |        |        | 1917      |           | MR file calls Old Ditch Mine, notes George Cole described as chatpiles, assay 2.9% PbS 30% barite.  |  |
| 0990276  |                    | 38.143504 | -90.663326 | Fletcher              |                                  | Underground?         | Past Producer | Lead; Barium; Iron-limonite |   |                       |       |       |        |        |           |           | no attempt at elev, 1 qtr.cms   |  |
| 0990278  |                    | 38.094545 | -90.478958 | Halifax               |                                  | Surface?             | Occurrence    | Lead                        | Reddick farm                              |                       |       |       |        |        |           |           |   |  |
| 0990279  |                    | 38.172121 | -90.626401 | Fletcher              |                                  |                      | Occurrence    | Lead                        | Jarrett farm                              |                       |       |       |        |        |           |           |   |  |



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| IMOP ID# | EPA ID#            | LATITUDE  | LONGITUDE  | QUAD                      | PROPER NAME                                 | TYPE OPERATION | STATUS        | COMMODITY    | OWNER                    | OPERATOR  | ACRES | DEPTH | OPENED    | CLOSED | RE-OPENED | RE-CLOSED | COMMENT   | ADDITIONAL COMMENTS |
|----------|--------------------|-----------|------------|---------------------------|---|----------------|---------------|--------------|--------------------------|---|-------|-------|-----------|--------|-----------|-----------|---|---------------------|
| 0990280  |                    | 38.170815 | -90.659213 | Fletcher                  | Big River Lead Mine; Hamil Mine; Hamel Mine | Underground    | Past Producer | Lead         | Hamil; Hamel             | Big River Lead Company; Ed Dixon; Big River L.M., M. &. Development Company |       | 65    | 1929      |        |           |           | SMI 1929 4 shafts.  |                     |
| 0990282  |                    | 38.182370 | -90.437235 | Festus                    | Becker Farm Mines                           | Underground    | Past Producer | Lead; Silver | Rome Becker; Becker Farm | Iva Schmitz-Rome & John   |       |       |           |        |           |           | ore sent to Doe Run smelter.  |                     |
| 0990283  |                    | 38.196158 | -90.720252 | Fletcher                  |   | Underground    | Past Producer | Lead         |                          |   |       |       |           |        |           |           | adit in hillside  |                     |
| 0990284  |                    | 38.199306 | -90.584413 | DeSoto                    |   |                | Occurrence?   | Lead         |                          |   |       |       |           |        |           |           |   |                     |
| 0990285  |                    | 38.230593 | -90.687797 | Fletcher                  |   |                | Past Producer | Lead         | Joe Long farm            |   |       |       |           |        |           |           |   |                     |
| 0990286  |                    | 38.347838 | -90.619542 | Cedar Hill or Belew Creek |   |                | Occurrence    | Lead         | James Varley land        |   |       |       |           |        |           |           |   |                     |
| 0990287  |                    | 38.288990 | -90.535885 | Belew Creek               |   |                | Occurrence    | Barium       |                          |   |       |       |           |        |           |           |   |                     |
| 0990288  |                    | 38.289454 | -90.535263 | Belew Creek               |   |                | Occurrence    | Barium       |                          |   |       |       |           |        |           |           |   |                     |
| 0990289  |                    | 38.314783 | -90.592479 | Belew Creek               |   |                | Occurrence    | Barium       | H.M. York                |   |       |       |           |        |           |           |   |                     |
| 0990290  |                    | 38.009500 | -90.572687 | Vineland                  |   |                | Past Producer | Barium       |                          |   |       | 20    |           |        |           |           | areal loc puts in sec 16.cms  |                     |
| 0990291  |                    | 38.053796 | -90.552615 | Vineland                  | Wilkerson Diggings                          |                | Past Producer | Barium       |                          |   |       | 37    |           |        |           |           |   |                     |
| 0990292  | JC-0039<br>JC-0058 | 38.052595 | -90.564643 | Vineland                  | Oliver Place                                |                | Past Producer | Barium       |                          |   |       | 20    |           |        |           |           | Msc 20764 not dug for 4 yrs.  |                     |
| 0990293  | JC-0059            | 38.050208 | -90.573382 | Vineland                  | Krowdinger Place                            |                | Past Producer | Barium       |                          |   |       | 79    |           |        |           |           | Msc 20764 little clay, looks favorable.                               |                     |
| 0990294  |                    | 38.041650 | -90.591906 | Vineland                  | Buchenberg's Place                          |                | Past Producer | Barium       |                          |   |       | 8     |           |        |           |           | Msc 20764 very little been dug.                                       |                     |
| 0990295  |                    | 38.075486 | -90.583079 | Vineland                  | Little Klondike District                    |                | Past Producer | Barium       |                          |   |       | 20    |           |        |           |           | Msc 20764 heavy production from just S of Vineland Fault Zone.        |                     |
| 0990296  |                    | 38.300011 | -90.536770 | Belew Creek               | Paust Place                                 |                | Past Producer | Barium       |                          |   |       | 9     |           |        |           |           |   |                     |
| 0990297  |                    | 38.194099 | -90.742432 | Fletcher                  | Stocking's Diggings                         |                | Past Producer | Barium       |                          |   |       | 15    |           |        |           |           | Msc 20764 recently dug.   |                     |
| 0990298  |                    | 38.197217 | -90.749917 | Richwoods or Fletcher     |   |                | Past Producer | Barium       |                          |   |       | 50    |           |        |           |           | Msc 20764 near Ditch Lead Mine, in edge of Ditch fissure.             |                     |
| 0990299  |                    | 38.187211 | -90.738957 | Fletcher                  |   |                | Past Producer | Barium       |                          |   |       | 20    |           |        |           |           | Msc 20764 near Stockings, Fletcher.                                   |                     |
| 0990300  |                    | 38.187795 | -90.733710 | Fletcher                  | Curtiss Diggings                            |                | Past Producer | Barium       |                          |   |       | 8     |           |        |           |           | Msc 20764 small cut.  |                     |
| 0990303  |                    | 38.097564 | -90.605134 | Vineland                  |   | Surface        | Occurrence    | Barium       |                          |   |       |       |           |        |           |           | Msc 20781 text has in SW, map shows in SE.                            |                     |
| 0990304  |                    | 38.204558 | -90.757308 | Richwoods                 |   | Surface        | Past Producer | Lead         |                          |   |       |       |           |        |           |           |   |                     |
| 0990305  |                    | 38.136840 | -90.606759 | De Soto                   |   | Surface        | Past Producer | Lead         |                          |   |       |       |           |        |           |           |   |                     |
| 0990306  |                    | 38.101341 | -90.588020 | Vineland                  |   | Surface        | Past Producer | Lead         |                          |   |       |       |           |        |           |           |   |                     |
| 0990307  |                    | 38.129264 | -90.434497 | Festus                    |   | Surface        | Past Producer | Lead         |                          |   |       |       |           |        |           |           |   |                     |
| 0990308  |                    | 38.114829 | -90.430760 | Halifax                   |   | Surface        | Past Producer | Lead         |                          |   |       |       |           |        |           |           |   |                     |
| 0990309  |                    | 38.098736 | -90.301433 | Danby                     |   | Surface        | Past Producer | Lead         |                          |   |       |       |           |        |           |           |   |                     |
| 0990312  |                    | 38.113357 | -90.569423 | Vineland                  |   | Underground    | Past Producer | Lead; Zinc   |                          | Walther Mining Company  |       | 50    |           |        |           |           | SMI 1912 2 shafts.  |                     |
| 0990314  |                    | 38.119646 | -90.693138 | Tiff                      | Dresser Mill #11 Tailings Pond              | Tailings Pond  | Past Producer | Barium       |                          |   |       |       | post-1975 |        |           |           | Msc 20779 under construction.   |                     |
| 0990315  |                    | 38.236794 | -90.773066 | Richwoods                 | Edull's Diggings                            |                | Past Producer | Barium; Lead |                          |   |       | 12    |           |        |           |           | Msc 20764 rather poor, but still worked. Loc puts in Jefferson Co.cms |                     |
| 0990317  |                    | 38.021613 | -90.601777 | Vineland                  | Red Hill; Old Blackwell Place               |                | Past Producer | Barium       |                          |   |       | 5     |           |        |           |           | Msc 20764 also in adjacent sections.                                  |                     |
| 0990318  |                    | 38.094438 | -90.307736 | Danby                     |   |                | Past Producer | Lead         |                          |   |       |       |           |        |           |           | no elev 1/2 sec cms   |                     |
| 0990321  |                    | 38.128039 | -90.662360 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990322  |                    | 38.128679 | -90.662807 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990323  |                    | 38.128852 | -90.662904 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990324  |                    | 38.129154 | -90.663123 | Fletcher                  |   | Underground    | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990325  |                    | 38.131717 | -90.665608 | Fletcher                  |   | Underground    | Past Producer | Lead?        |                          |   |       | 15    |           |        |           |           | probably small.cms  |                     |
| 0990326  |                    | 38.133008 | -90.673438 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990327  |                    | 38.153205 | -90.691864 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990328  |                    | 38.153284 | -90.692204 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990329  |                    | 38.153507 | -90.692551 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990330  |                    | 38.154181 | -90.694253 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990331  |                    | 38.153987 | -90.694476 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990332  |                    | 38.154173 | -90.694789 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990333  |                    | 38.154361 | -90.696118 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990334  |                    | 38.154607 | -90.696259 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990335  |                    | 38.154406 | -90.696551 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990336  |                    | 38.154170 | -90.697380 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990337  |                    | 38.154380 | -90.697510 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990338  |                    | 38.154268 | -90.697810 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990339  |                    | 38.154390 | -90.698057 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990340  |                    | 38.172514 | -90.715248 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990341  |                    | 38.172744 | -90.715503 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990342  |                    | 38.171150 | -90.724832 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990343  |                    | 38.170958 | -90.725124 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990344  |                    | 38.170911 | -90.725490 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |
| 0990345  |                    | 38.171000 | -90.725899 | Fletcher                  |   |                | Past Producer | Lead?        |                          |   |       |       |           |        |           |           | probably small.cms  |                     |



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|----------|--|-----------|------------|----------|-------------|----------------|---------------|---------------|-------|------------------------|-------|-------|--------|--------|-----------|-----------|--|---------------------|
| 0990346  |  | 38.171508 | -90.725129 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990347  |  | 38.171378 | -90.725430 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990348  |  | 38.171279 | -90.725867 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990349  |  | 38.171686 | -90.725489 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990350  |  | 38.171646 | -90.725753 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990351  |  | 38.177884 | -90.724965 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990352  |  | 38.180342 | -90.726224 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990353  |  | 38.193459 | -90.717265 | Fletcher |             |                | Past Producer | Barium; Lead? |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990354  |  | 38.205339 | -90.699879 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990355  |  | 38.205331 | -90.699936 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990356  |  | 38.205352 | -90.700073 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990357  |  | 38.205403 | -90.699957 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990358  |  | 38.205433 | -90.700081 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990359  |  | 38.223754 | -90.724645 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990360  |  | 38.176178 | -90.746273 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990361  |  | 38.176154 | -90.746433 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990362  |  | 38.176003 | -90.746564 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990363  |  | 38.176458 | -90.747702 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990364  |  | 38.176336 | -90.747957 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990365  |  | 38.176295 | -90.748175 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990366  |  | 38.176337 | -90.748448 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990367  |  | 38.176526 | -90.747986 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990368  |  | 38.176432 | -90.748240 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990369  |  | 38.176549 | -90.748248 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990370  |  | 38.176546 | -90.748544 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990371  |  | 38.176513 | -90.748694 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990372  |  | 38.176746 | -90.748664 | Fletcher |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | probably small.cms   |                     |
| 0990375  |  | 38.110670 | -90.644073 | Tiff     |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           |  |                     |
| 0990376  |  | 38.046148 | -90.547093 | Vineland |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           |  |                     |
| 0990377  |  | 38.020543 | -90.543414 | Vineland |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           |  |                     |
| 0990382  |  | 38.128563 | -90.657415 | Fletcher |             |                | Past Producer | Lead          |       |                        |       |       |        |        |           |           |  |                     |
| 0990383  |  | 38.030835 | -90.542204 | Vineland |             |                | Past Producer | Lead          |       |                        |       |       |        |        |           |           |  |                     |
| 0990384  |  | 38.122265 | -90.406718 | Halifax  |             |                | Past Producer | Lead          |       |                        |       |       |        |        |           |           |  |                     |
| 0990385  |  | 38.192871 | -90.726406 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990386  |  | 38.173937 | -90.705969 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990387  |  | 38.173665 | -90.697131 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990388  |  | 38.174083 | -90.741829 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           | Plots in different section on SEMO-096, used topography for location.cms |                     |
| 0990389  |  | 38.168351 | -90.733388 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990390  |  | 38.168290 | -90.740957 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990391  |  | 38.009491 | -90.610964 | Vineland |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990392  |  | 38.186675 | -90.728493 | Fletcher |             |                | Past Producer | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990393  |  | 38.196731 | -90.733570 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990394  |  | 38.159081 | -90.696940 | Fletcher |             |                | Occurrence    | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990395  |  | 38.177510 | -90.721929 | Fletcher |             |                | Past Producer | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990396  |  | 38.179926 | -90.716420 | Fletcher |             |                | Past Producer | Barium        |       |                        |       |       |        |        |           |           |  |                     |
| 0990397  |  | 38.110670 | -90.644096 | Tiff     |             |                | Past Producer | Lead?         |       |                        |       |       |        |        |           |           | related to 0990135?  |                     |
| 0990398  |  | 38.040230 | -90.509932 | Vineland |             | Surface        | Past Producer | Lead          |       |                        |       |       |        |        |           |           |  |                     |
| 0990399  |  | 38.175083 | -90.728271 | Fletcher |             | Washer         | Past Producer | Barium        | Scott | Whaley; Scott & Whaley |       |       |        |        |           |           |  |                     |
| Notes:   | Missouri Geological Survey Inventory of Mines, Occurrences, and Prospects<br>United States Environmental Protection Agency |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
| IMOP     |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
| EPA      |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |
|          |  |           |            |          |             |                |               |               |       |                        |       |       |        |        |           |           |  |                     |



Table 2: Summary of Screening and Sampling Results  
Jefferson County Lead Site

| EPA ID # | Property Type | Location |        | Coordinates |           | XRF Screening Results |             |       |       |      |       |       |     |     | Laboratory Confirmation Data |           |          | Water samples  |          |          |             |            |  |  |
|----------|---------------|----------|--------|-------------|-----------|-----------------------|-------------|-------|-------|------|-------|-------|-----|-----|------------------------------|-----------|----------|----------------|----------|----------|-------------|------------|--|--|
|          |               | Street   | Number | City        | Lat       | Long                  | C1          | C2    | C3    | C4   | C5    | C6    | C7  | C8  | C9                           | cell      | number   | result (mg/kg) | type     | number   | Lead (µg/L) | Cad (µg/L) |  |  |
| JC-0001  | residential   |          |        | DeSoto      | 38.0171   | -90.58554             | 205         | 120   | 143   | 188  | 58.6  |       |     |     |                              | C8 (pond) | 3167-205 | 61.2           | well     | 3166-302 | 1.00 U      | 2.38       |  |  |
| JC-0002  | residential   |          |        | DeSoto      | 38.01285  | -90.58538             | 73.2        | 57    | 68.3  | 52   | 65    | 96.2  |     |     |                              | C3        | 3166-202 | 55.8           | well     | 3166-304 | 1.00 U      | 1.69       |  |  |
| JC-0003  | residential   |          |        | DeSoto      | 38.01108  | -90.57442             | 159         | 299   | 72.7  | 52.7 | 167   | 7     |     |     |                              |           |          | well           | 3166-305 | 6.39     | 1.06        |            |  |  |
| JC-0004  | residential   |          |        | Hillsboro   | 38.20548  | -90.58885             | 49          | 45    | 43    | 55   | 47    |       |     |     |                              |           |          | well           | 3210-101 | 1.0U     | 1.00 U      |            |  |  |
| JC-0005  | residential   |          |        | Hillsboro   | 38.20588  | -90.5893              | <48         | <44   | <47   | <40  | 55.3  | <44   |     |     |                              |           |          | well           | 3167-301 | 1.0U     | 1.00 U      |            |  |  |
| JC-0006  | residential   |          |        | Hillsboro   | 38.20555  | -90.58882             | 64.6        | <52   | 87.8  | 68.8 | 109.9 | 98.6  |     |     |                              |           |          | well           | 3166-306 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0007  | residential   |          |        | Hillsboro   | 38.20444  | -90.58909             | 89.3        | <55   | <56   | <59  | <63   |       |     |     |                              |           |          | well           | 3166-307 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0008  | residential   |          |        | Hillsboro   | 38.20351  | -90.58901             | <54         | 154.3 | 100.8 | 82.5 | 63    |       |     |     |                              |           |          | well           | 3166-308 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0009  | residential   |          |        | Hillsboro   | 38.20284  | -90.59                | 265.7       | 179   | 64.7  | 63.1 |       |       |     |     |                              |           |          | well           | 3166-309 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0010  | residential   |          |        | Hillsboro   | 38.20123  | -90.59032             | 51.4        | <63   | <50   |      |       |       |     |     |                              |           |          | well           | 3166-310 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0011  | residential   |          |        | Hillsboro   | 38.20012  | -90.58922             | 64.5        | 54    | <54   | 76.7 | <62   |       |     |     |                              |           |          | well           | 3166-311 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0012  | residential   |          |        | Hillsboro   | 38.19706  | -90.58933             | 79.2        | 902   | 875   | 70.3 | <69   |       |     |     |                              | C3        | 3166-203 | 568            | well     | 3166-312 | 1.74        | 1.00 U     |  |  |
| JC-0013  | residential   |          |        | Hillsboro   | 38.19532  | -90.58971             | <53         | 75.2  | <45   | <62  | <47   | <49   |     |     |                              |           |          | well           | 3166-313 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0014  | residential   |          |        | Hillsboro   | 38.24255  | -90.58042             | 70.6        | <48   | 60.9  | <49  |       |       |     |     |                              |           |          | well           | 3167-302 | 2.00 U   | 2.0U        |            |  |  |
| JC-0015  | residential   |          |        | Hillsboro   | 38.19862  | -90.59003             | <52         | 107.3 | 63.6  | <51  |       |       |     |     |                              |           |          | well           | 3166-314 | 2.99     | 1.00 U      |            |  |  |
| JC-0016  | residential   |          |        | Hillsboro   | 38.19645  | -90.58946             | 60.2        | <53   | <54   | 91.3 |       |       |     |     |                              |           |          | well           | 3166-315 | 1.0U     | 1.00 U      |            |  |  |
| JC-0017  | residential   |          |        | Hillsboro   | 38.25094  | -90.54755             | 57          | 41.8  | 65    | 52   |       |       |     |     |                              |           |          | well           | 3167-303 | 2.1      | 2.0U        |            |  |  |
| JC-0018  | residential   |          |        | Hillsboro   | 38.24369  | -90.58244             | 56          | 69    | <60   | <72  |       |       |     |     |                              |           |          | well           | 3167-304 | 4.18     | 1.00 U      |            |  |  |
| JC-0019  | residential   |          |        | DeSoto      | 38.00512  | -90.59406             | 269         | 350   | 98.3  | 96.7 | 97    |       |     |     |                              | C1        | 3166-204 | 2380           | well     | 3166-316 | 1.00 U      | 1.00 U     |  |  |
| JC-0020  | residential   |          |        | DeSoto      | 38.00656  | -90.595707            | 64.8        | 61    | 67.4  | 133  | 79.7  | 52.4  |     |     |                              |           |          | well           | 3166-317 | 23.7     | 1.00 U      |            |  |  |
| JC-0021  | residential   |          |        | DeSoto      | 38.00496  | -90.59123             | 115         | 86.3  | 428.3 | 200  | 328   | 167.7 |     |     |                              | C6        | 3166-205 | 229            | well     | 3166-318 | 3.97        | 1.00 U     |  |  |
| JC-0022  | residential   |          |        | DeSoto      | 38.0117   | -90.57573             | 113         | 90    | 55    | 372  |       |       |     |     |                              | C4        | 3166-206 | 376            | well     | 3166-319 | 1.00 U      | 1.2        |  |  |
| JC-0023  | residential   |          |        | DeSoto      | 38.0336   | -90.61588             | not sampled |       |       |      |       |       |     |     |                              |           |          |                |          |          |             |            |  |  |
| JC-0024  | residential   |          |        | DeSoto      | 38.03219  | -90.61083             | 277         | 505   | 155   | 109  | 150   |       |     |     |                              |           |          |                | well     | 3166-320 | 1.00 U      | 1.00 U     |  |  |
| JC-0025  | residential   |          |        | DeSoto      | 38.02961  | -90.60406             | 78          | 62    | 48    | 52   | 48    | ???   |     |     |                              |           |          |                | pond     | 3166-321 | 24.1        | 1.00 U     |  |  |
|          |               |          |        |             |           |                       |             |       |       |      |       |       |     |     |                              |           |          | well           | 3166-322 | 11.8     |             |            |  |  |
| JC-0026  | Haul Road     |          |        | DeSoto      | 38.02424  | -90.55504             | 220         |       |       |      |       |       |     |     |                              |           |          |                |          |          |             |            |  |  |
| JC-0027  | source        |          |        | DeSoto      | 38.01266  | -90.5806              | 227         | 589   |       |      |       |       |     |     |                              |           |          |                | pond     | 3166-323 | 22.7        | 1.00 U     |  |  |
| JC-0028  | source        |          |        | DeSoto      | 38.0113   | -90.58435             | 1070        |       |       |      |       |       |     |     |                              | C1        | 3166-207 | 1190           |          |          |             |            |  |  |
| JC-0029  | source        |          |        | DeSoto      | 38.025438 | -90.55439             | 1647        | 1647  | 431   |      |       |       |     |     |                              |           |          |                |          |          |             |            |  |  |
| JC-0030  | residential   |          |        | DeSoto      | 38.05115  | -90.58548             | 153         | 329   | 61    | <52  | <48   | <69   |     |     |                              |           |          | well           | 3167-305 | 1.73     | 1.00 U      |            |  |  |
| JC-0031  | residential   |          |        | DeSoto      | 38.05581  | -90.5663              | 240         | 132   | 98    | 169  |       |       |     |     |                              | C1        | 3167-206 | 272            | well     | 3167-306 | 2.1         | 1.00 U     |  |  |
| JC-0032  | residential   |          |        | DeSoto      | 38.05376  | -90.56465             | 157         | 60    | 69    | 69   | 81    | 82    |     |     |                              | C1        | 3167-208 | 159            | well     | 3167-307 | 2.42        | 1.00 U     |  |  |
| JC-0033  | residential   |          |        | DeSoto      | 38.065    | -90.57544             | 64          | 61    | 62    | 69   | <50   | 56    |     |     |                              |           | 3167-204 | 62.3           | well     | 3167-308 | 2.00 U      | 2.0 U      |  |  |
| JC-0034  | residential   |          |        | DeSoto      | 38.04945  | -90.57394             | <53         | 69    | 70    | 50   | 47    |       |     |     |                              |           |          | well           | 3167-309 | 6.81     | 4.41        |            |  |  |
| JC-0035  | residential   |          |        | DeSoto      | 38.04889  | -90.57174             | 48          | 49    | 54    | 45   | 59    | 51    |     |     |                              | C2        | 3167-207 | 25.2           | well     | 3167-310 | 3.39        | 1.00 U     |  |  |
|          |               |          |        |             |           |                       |             |       |       |      |       |       |     |     |                              |           |          | well           | 3167-311 | 1.00 U   | 1.00 U      |            |  |  |
| JC-0036  | residential   |          |        | DeSoto      | 38.0581   | -90.6134              | 45          | 59    | 554   | <62  | <44   | 68    | <52 | <61 |                              | C1        | 3209-001 | 37.6           | pond     | 3167-312 | 8.16        |            |  |  |
| JC-0037  | residential   |          |        | DeSoto      | 38.06567  | -90.06565             | <55         | 67    | 88    | 79   | 79    |       |     |     |                              |           |          |                | well     | 3167-313 | 2.14        | 1.00 U     |  |  |
| JC-0038  | school        |          |        | DeSoto      | 38.04572  | -90.54868             | 65          | 178   | 77    | 67   | 71    | 73    | 61  |     |                              | C2        | 3167-211 | 156            | well     | 3167-314 | 3.04        | 1.00 U     |  |  |
| JC-0039  | source        |          |        | DeSoto      | 38.052595 | -90.584643            | 442         |       |       |      |       |       |     |     |                              |           |          | no well        |          |          |             |            |  |  |
| JC-0040  | residential   |          |        | DeSoto      | 38.13186  | -90.65356             | <47         | 71    | 75    | <41  | <62   | <48   |     |     |                              |           |          | well           | 3209-101 | 1.51 J   | 1.00 U      |            |  |  |
| JC-0041  | surface water |          |        | N/A         | 38.00887  | -90.62348             | 427         |       |       |      |       |       |     |     |                              |           |          | no well        |          |          |             |            |  |  |
| JC-0042  | surface water |          |        | N/A         | 38.12216  | -90.58071             | <62         |       |       |      |       |       |     |     |                              |           |          | well           | 3209-102 | 1.16 J   | 1.00 U      |            |  |  |
| JC-0043  | residential   |          |        | DeSoto      | 38.13364  | -90.65387             | <49         | 57.5  | <45   | <49  | <49   |       |     |     |                              |           |          | well           | 3210-102 | 1.03 J   | 1.00 U      |            |  |  |



Table 2: Summary of Screening and Sampling Results  
Jefferson County Lead Site

| EPA ID # | Property Type | Location |        | Coordinates |           | XRF Screening Results |       |      |       |       |       |      |       |       |    |              |          |                  | Laboratory Confirmation Data |          |             | Water samples |  |  |  |
|----------|---------------|----------|--------|-------------|-----------|-----------------------|-------|------|-------|-------|-------|------|-------|-------|----|--------------|----------|------------------|------------------------------|----------|-------------|---------------|--|--|--|
|          |               | Street   | Number | City        | Lat       | Long                  | C1    | C2   | C3    | C4    | C5    | C6   | C7    | C8    | C9 | cell         | number   | result (mg/kg)   | type                         | number   | Lead (µg/L) | Cad (µg/L)    |  |  |  |
| JC-0044  | residential   |          |        | DeSoto      | 38.1221   | -90.69035             | <54   | <110 | <54   | <62   | 2487  |      |       |       |    | C5           | 3209-002 | 2570             | well                         | 3209-103 | 1.00 UJ     | 1.00 U        |  |  |  |
| JC-0045  | residential   |          |        | Fletcher    | 38.1653   | -90.73899             | 225   | 175  | 258   | 345   | 194   | 345  | 176   | 191   |    | C8           | 3209-008 | 171              | well                         | 3209-104 | 1.00 U      | 1.22          |  |  |  |
| JC-0046  | residential   |          |        | Fletcher    | 38.16518  | -90.73535             | 121   | 123  | 71.4  |       |       |      |       |       |    |              |          | well (no sample) |                              |          |             |               |  |  |  |
| JC-0047  | residential   |          |        | Fletcher    | 38.16518  | -90.73535             | 273   | 207  | 106   | 83    |       |      |       |       |    | C1           | 3209-004 | 308              | well                         | 3209-105 | 1.00 UJ     | 1.00 U        |  |  |  |
| JC-0048  | residential   |          |        | Fletcher    | 38.16479  | -90.73618             | 170   | 107  | 150   | 55    |       |      |       |       |    |              |          | well             | 3209-106                     | 5.66 J   | 1.00 U      |               |  |  |  |
| JC-0049  | residential   |          |        | DeSoto      | 38.17289  | -90.69375             | 62    | 73   | 84    | <36   | <51   | 51   | 101   |       |    | C3           | 3209-005 | 88.5             | well                         | 3209-107 | 2.95 J      | 1.00 U        |  |  |  |
| JC-0050  | residential   |          |        | DeSoto      | 38.00663  | -90.59249             | <53   | <50  | 59    | 1770  | 87    |      |       |       |    |              |          | well             | 3166-324                     | 1.00 U   | 1.00 U      |               |  |  |  |
| JC-0051  | residential   |          |        | DeSoto      | 38.00573  | -90.59318             | 85    | 108  | 106   | 112   | 57    |      |       |       |    |              |          | well             | 3166-325                     | 1.00 U   | 1.00 U      |               |  |  |  |
| JC-0052  | residential   |          |        | DeSoto      | 38.00772  | -90.60807             | 1120  | 126  | 3816  | 2946  | 123   | 3926 |       |       |    | C3           | 3167-201 | 3450             | well                         | 3166-326 | 1.00 U      | 1.00 U        |  |  |  |
| JC-0053  | residential   |          |        | DeSoto      | 38.00987  | -90.61031             | 133   | 259  | 497   | 1430  | 2013  |      |       |       |    |              |          | well             | 3166-328                     | 1.00 U   | 1.00 U      |               |  |  |  |
| JC-0054  | residential   |          |        | DeSoto      | 38.01743  | -90.60103             | 164   | 79   | <62   | 72    | 63    | 867  |       |       |    | C1           | 3167-203 | 115              | well                         | 3166-327 | 1.00 U      | 1.00 U        |  |  |  |
| JC-0055  | residential   |          |        | DeSoto      | 38.00494  | -90.59593             | 69    | 75   | 81    | 88    |       |      |       |       |    | C1           | 3167-210 | 42.8             | well                         | 3167-315 | 2.79        | 1.00 U        |  |  |  |
| JC-0056  | residential   |          |        | Hillsboro   | 38.24412  | -90.58248             | 73    | 131  | 377   | 60    |       |      |       |       |    |              |          | well             | 3167-316                     | 2.00 U   | 2.0 U       |               |  |  |  |
| JC-0057  | surface water |          |        |             | 38.04388  | -90.62029             | 742   |      |       |       |       |      |       |       |    | C1(sediment) | 3167-202 | 607              | Big River                    | 3167-327 | 17.8        | 1.00 U        |  |  |  |
| JC-0058  | source        |          |        |             | 38.0526   | -90.59518             | 186   | 109  |       |       |       |      |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0059  | source        |          |        | DeSoto      | 38.050208 | -90.573382            | 58    |      |       |       |       |      |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0060  | residential   |          |        | DeSoto      | 38.06851  | -90.5777              | 63    | <59  | 92    | 115   | 70    | 108  |       |       |    |              |          | well             | 3167-317                     | 1.39     | 1.00 U      |               |  |  |  |
| JC-0061  | residential   |          |        | DeSoto      | 38.04833  | -90.5756              | 64    | <49  | 63    | 61    | <51   | 58   |       |       |    |              |          | well             | 3167-318                     | 1.00 U   | 1.00 U      |               |  |  |  |
| JC-0062  | residential   |          |        |             |           |                       |       |      |       |       |       |      |       |       |    |              |          | pond             | 3167-319                     | 7.36     |             |               |  |  |  |
| JC-0062  | residential   |          |        | DeSoto      | 38.04745  | -90.57246             | 124   | 59   | 91    | 60    | 78    |      |       |       |    | C3           | 3167-209 | 72.3             | well                         | 3167-320 | 2.89        | 1.00 U        |  |  |  |
| JC-0063  | residential   |          |        | DeSoto      | 38.0941   | -90.58539             | 56    | <51  | 3483  | 68    | 335   |      |       |       |    |              |          | well             | 3167-321                     | 11.2     | 1.00 U      |               |  |  |  |
| JC-0064  | source        |          |        | DeSoto      | 38.095556 | -90.49277             | <47   | <33  |       |       |       |      |       |       |    |              |          | pond             | 3167-322                     | 1.00 U   | 1.00 U      |               |  |  |  |
| JC-0065  | residential   |          |        | DeSoto      | 38.09392  | -90.58288             | <59   | <51  |       |       |       |      |       |       |    |              |          | well             | 3167-323                     | 8.76     | 1.00 U      |               |  |  |  |
| JC-0066  | residential   |          |        | DeSoto      | 38.10978  | -90.62589             | 244   | 717  | 78    | <55   |       |      |       |       |    |              |          | well             | 3167-324                     | 1.00 U   | 1.00 U      |               |  |  |  |
| JC-0067  | residential   |          |        | DeSoto      | 38.10483  | -90.62662             | <50   | <45  | 54    | 70    | 51    |      |       |       |    | C4           | 3209-006 | 35.4             | well                         | 3167-325 | 1.00 U      | 1.00 U        |  |  |  |
| JC-0068  | residential   |          |        | DeSoto      | 38.06498  | -90.57811             | 55    | 82   | 125   | 340   | 54    | 77   |       |       |    |              |          | well             | 3167-326                     | 1.93     | 1.00 U      |               |  |  |  |
| JC-0069  | residential   |          |        | DeSoto      | 38.09247  | -90.58447             | 82    | <43  | 65    | <54   |       |      |       |       |    | C1           | 3209-007 | 116              | no well                      |          |             |               |  |  |  |
| JC-0070  | residential   |          |        | DeSoto      | 38.09411  | -90.58265             | 510   | 75   | 78    | 82    |       |      |       |       |    | C1           | 3210-001 | 670              | no well                      |          |             |               |  |  |  |
| JC-0071  | residential   |          |        | DeSoto      | 38.1753   | -90.69203             | 209   | 399  | 84    | 802   | <58.0 |      |       |       |    | C2           | 3210-002 | 402              | well                         | 3210-103 | 36.1        | 1.00 U        |  |  |  |
| JC-0072  | residential   |          |        | Festus      | 38.23602  | -90.458799            | 86    | 58   | 70    | 67    |       |      |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0073  | residential   |          |        | Festus      | 38.23547  | -90.45387             | 86    | 66   | <75.0 |       |       |      |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0074  | residential   |          |        | Festus      | 38.23745  | -90.45921             | 152   | 58   | <52   | <48   | 113   | <44  |       |       |    | C1           | 3210-003 | 193              | no well                      |          |             |               |  |  |  |
| JC-0075  | residential   |          |        | Festus      | 38.17485  | -90.40287             | 67    | 54.8 | 45    | 54.8  |       |      |       |       |    |              |          | well             | 3210-104                     | 1.63 J   | 1.00 U      |               |  |  |  |
| JC-0076  | residential   |          |        | Festus      | 38.23895  | -90.45142             | 72.2  | 77.2 | <59.0 | 72.9  | <65.0 |      |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0077  | residential   |          |        | Festus      | 38.23919  | -90.45493             | 54    | 383  | 56    | 54    |       |      |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0078  | residential   |          |        | Festus      | 38.23865  | -90.45683             | 61    | 38   | 57    | 39    | 58.5  | 36.5 |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0079  | residential   |          |        | Festus      | 38.23905  | -90.45743             | <63.0 | 80.4 | 74.3  | 96.7  | <68.0 | 62.3 | <56.0 | 62.8  |    | C4           | 3222-001 | 50.1             | no well                      |          |             |               |  |  |  |
| JC-0080  | residential   |          |        | Festus      | 38.24213  | -90.45199             | 56    | 59   | 75    | 54    |       |      |       |       |    |              |          | no well          |                              |          |             |               |  |  |  |
| JC-0081  | residential   |          |        | DeSoto      | 38.13592  | -90.65227             | <48   | 58   | 69    | 74    | 58    |      |       |       |    |              |          | well             | 3209-108                     | 1.00 UJ  | 1.00 U      |               |  |  |  |
| JC-0082  | residential   |          |        | DeSoto      | 38.13406  | -90.60191             |       |      |       |       |       |      |       |       |    |              |          | well             | 3209-109                     | 1.00 UJ  | 1.00 U      |               |  |  |  |
| JC-0083  | residential   |          |        | DeSoto      | 38.12876  | -90.60638             | 57.3  | 1333 | <55.0 | <52.0 | 91    | 75.9 | 106   | <66.0 |    | C5           | 3210-004 | 105              | well                         | 3209-110 | 1.73 J      | 1.00 U        |  |  |  |
| JC-0084  | residential   |          |        | DeSoto      | 38.16479  | -90.57212             | 80    | 109  | 58    | 68    | 67    | 51   |       |       |    | C1           | 3222-002 | 97.1             | well                         | 3210-106 | 1.00 UJ     | 1.00 U        |  |  |  |
| JC-0085  | surface water |          |        | N/A         | 38.03782  | -90.5991              | 59    |      |       |       |       |      |       |       |    |              |          | Tiff Creek       | 3167-328                     | 2.89     | 1.00 U      |               |  |  |  |
| JC-0086  | surface water |          |        | N/A         | 38.2126   | -90.70617             | 599   |      |       |       |       |      |       |       |    |              |          | Big River        | 3167-330                     | 22.1     | 1.00 U      |               |  |  |  |
| JC-0087  | surface water |          |        |             | 38.12134  | -90.67574             | 330   |      |       |       |       |      |       |       |    | C1           | 3209-008 | 335              | Big River                    | 3167-331 | 15          | 1.00 U        |  |  |  |
| JC-0088  | residential   |          |        | DeSoto      | 38.17345  | -90.69449             | 44    | 164  | 22    | 64    | 44    |      |       |       |    | C3           | 3209-088 | 14.7             | well                         | 3209-111 | 30.7 J      | 1.00 U        |  |  |  |
| JC-0089  | residential   |          |        | DeSoto      | 38.16953  | -90.68948             | 229   | 102  | 60    | 195   | 52    | 60   |       |       |    |              |          | well             | 3209-112                     | 7.93 J   | 1.11        |               |  |  |  |



Table 2: Summary of Screening and Sampling Results  
Jefferson County Lead Site

| EPA ID #  | Property Type | Location |        | Coordinates |           | XRF Screening Results |             |       |       |       |       |       |      |     |    | Laboratory Confirmation Data |          |                | Water samples    |          |             |            |
|-----------|---------------|----------|--------|-------------|-----------|-----------------------|-------------|-------|-------|-------|-------|-------|------|-----|----|------------------------------|----------|----------------|------------------|----------|-------------|------------|
|           |               | Street   | Number | City        | Lat       | Long                  | C1          | C2    | C3    | C4    | C5    | C6    | C7   | C8  | C9 | cell                         | number   | result (mg/kg) | type             | number   | Lead (µg/L) | Cad (µg/L) |
| JC-0090   | residential   |          |        | DeSoto      | 38.16796  | -90.69049             | 44          | 54    | <54   | <47   | <50   | <44   | <61  |     |    |                              |          |                | well (no sample) |          |             |            |
| JC-0091   | residential   |          |        | Hillsboro   | 38.26528  | -90.50771             | 43          | 53    | 72    | 69    | 57    | 52    | 49   |     |    |                              |          |                | well             | 3209-113 | 1.49 J      | 1.00 U     |
| JC-0092   | residential   |          |        | Hillsboro   | 38.26424  | -90.50483             | 60          | <51.0 | <52.0 | 62    | <62.0 | 64    |      |     |    |                              |          |                | well             | 3210-105 | 1.00 UJ     | 1.00 U     |
| JC-0093   | residential   |          |        | DeSoto      | 38.12625  | -90.59609             | <61         | 91    | 32    | 67    | 723   |       |      |     | C5 | 3209-005                     | 899      | well           | 3209-114         | 10.9J    | 1.00 U      |            |
| JC-0094   | residential   |          |        | Hillsboro   | 38.25422  | -90.54783             | 102         | 73    | 68    | <51.0 | <68.0 |       |      |     |    |                              |          |                | well             | 3222-101 | 4.21        | 1.00 U     |
| JC-0095   | residential   |          |        | Hillsboro   | 38.25837  | -90.54169             | 54          | 54    | 56    | 55    | 57    | 60    | 52   |     | C8 | 3222-003                     | 35.5     | well           | 3222-102         | 1.00 U   | 1.00 U      |            |
| JC-0096   | residential   |          |        | Cedar Hill  | 38.34574  | -90.61526             | 197         | 76    |       |       |       |       |      |     | C1 | 3222-004                     | 199      | well           |                  |          |             |            |
| JC-0097   | residential   |          |        | Morse Mill  | 38.27805  | -90.66228             | 79          | 129   | <60.0 | 65    | <70.0 | 96    | 755  |     |    |                              |          |                | well             | 3210-107 | 3.36J       | 1.00 U     |
| JC-0098   | residential   |          |        | Dittmer     | 38.27843  | -90.66277             | 70.4        | 762   | <51.0 | 73    | 83    |       |      |     | C2 | 3210-010                     | 799      | well           | 3210-108         | 2.42 J   | 1.00 U      |            |
| JC-0099   | residential   |          |        | Cedar Hill  | 38.3457   | -90.61533             | 232         | 68    | 85    |       |       |       |      |     |    |                              |          |                | no well          |          |             |            |
| JC-0100   | residential   |          |        | Hillsboro   | 38.26706  | -90.50787             | 52          | 58    | 53    | 55    | 43    | 47    | 55   |     |    |                              |          |                | well             | 3222-103 | 5.06        | 1.00U      |
| JC-0101   | residential   |          |        | Fenton      | 38.10255  | -90.32978             | 44          | 48    | 62    | 55    | 60    | 71    | 44   |     |    |                              |          |                | well             | 3222-104 | 2.57        | 1.00 U     |
| JC-0102   | residential   |          |        | DeSoto      | 38.13656  | -90.61186             | <44         | 33    | 49    | 58    | 45    | 55    | 59   | 543 | 48 | C8                           | 3222-005 | 587            | well             | 3222-105 | 7.96        | 1.00 U     |
| JC-0103   | residential   |          |        | Festus      | 38.0942   | -90.31133             | <49.0       | <50.0 | <49.0 | 64    | <56.0 |       |      |     |    |                              |          |                | well             | 3222-106 | 1.00 U      | 1.00 U     |
| JC-0104   | residential   |          |        | Festus      |           |                       | not sampled |       |       |       |       |       |      |     |    |                              |          |                |                  |          |             |            |
| JC-0105   | residential   |          |        | Hillsboro   | 38.28485  | -90.51275             | 109         | 117   | 1078  | 440   | 8467  | 2347  |      |     | C5 | 3222-007                     | 7280     | well           | 3210-109         | 6.05 J   | 1.21        |            |
| JC-0106   | residential   |          |        | Hillsboro   | 38.26563  | -90.50462             | <60.0       | <66.0 | <63.0 | 73    |       |       |      |     |    |                              |          |                | well             | 3222-107 | 3.05        | 1.00 U     |
| JC-0107   | residential   |          |        | DeSoto      | 38.15083  | -90.68855             | 270         | 253   | 429   | 381   |       |       |      |     | C1 | 3222-006                     | 387      | well           | 3210-110         | 8.1      | 1.00 U      |            |
| JC-0108   | residential   |          |        | Festus      | 38.23834  | -90.45076             | 63          | 63    |       |       |       |       |      |     |    |                              |          |                | no well          |          |             |            |
| JC-0109   | residential   |          |        | DeSoto      | 38.17125  | -90.68676             | 50          | 435   | 74    | 184   | 55    | 70    |      |     |    |                              |          |                | well             | 3210-111 | 3.03 J      | 1.86       |
| JC-0110   | residential   |          |        | Festus      | 38.23866  | -90.45013             | 203         | 122   | 67    | 92    | 144   | 78    | 146  |     | C7 | 3222-008                     | 207      | no well        |                  |          |             |            |
| JC-0111   | surface water |          |        | N/A         | 38.1637   | -90.733567            | <48         |       |       |       |       |       |      |     |    |                              |          |                | Calico Creek     | 3222-108 | 1.00 UJ     | 1.00 U     |
| JC-0112   | residential   |          |        | DeSoto      | 38.17008  | -90.6879              | 87          | 68.9  | 122   | 279   | 100   |       |      |     | C1 | 3210-006                     | 79.3     | well           | 3209-115         | 1.00 UJ  | 1.00 U      |            |
| JC-0113   | residential   |          |        | DeSoto      | 38.17572  | -90.68802             | <45         | 48.3  | <49   | 55.7  | 34.5  | <52   |      |     |    |                              |          |                | well             | 3209-116 | 1.00 UJ     | 1.00 U     |
| JC-0114   | residential   |          |        | DeSoto      | 38.13912  | -90.60972             | <60         | 36    | 59    | <57   | <44   |       |      |     |    |                              |          |                | well             | 3209-117 | 2.04 J      | 1.00 U     |
| JC-0115   | residential   |          |        | DeSoto      | 38.1383   | -90.6054              | <59         | 73    | 73    | 68    | 42    |       |      |     |    |                              |          |                | well             | 3209-118 | 10.4 J      | 1.00 U     |
| JC-0116   | residential   |          |        | Hillsboro   | 38.19714  | -90.6548              | <55         | <50   | 41    | <50   |       |       |      |     |    |                              |          |                | well             | 3209-119 | 2.83 J      | 1.00 U     |
| JC-0117   | residential   |          |        | Hillsboro   | 38.19867  | -90.65692             | 61          | <64   | 79.2  | 33    | 107   | 35    |      |     | C5 | 3210-007                     | 112      | well           | 3210-112         | 5.83 J   | 1.00 U      |            |
| JC-0118   | residential   |          |        | DeSoto      | 38.17777  | -90.69168             |             |       |       |       |       |       |      |     |    |                              |          |                | well             | 3210-113 | 8.1         | 1.00 U     |
| JC-0119   | residential   |          |        | Dittmer     | 38.16906  | -90.74135             | <57.0       | <51.0 | <59.0 | 69    | 91    | 66.5  |      |     |    |                              |          |                | well             | 3210-114 | 2.34 J      | 1.00 J     |
| JC-0120   | residential   |          |        | Dittmer     | 38.2011   | -90.75543             | 652         | 92    | 69    | 193   | 167   | 52    |      |     | C1 | 3210-008                     | 646      | well           | 3210-115         | 75.73    | 2.14        |            |
| JC-0121   | residential   |          |        | Dittmer     | 38.19688  | -90.75489             | <52         | 132   | 214   | 196   |       |       |      |     | C3 | 3210-009                     | 265      | well           | 3210-116         | 15.73    | 1.00 U      |            |
| JC-0122   | residential   |          |        | Dittmer     | 38.20027  | -90.76072             | 77.2        | 89.7  | <48.0 | <48.0 | 80.4  | 69.4  |      |     |    |                              |          |                | well             | 3210-117 | 2.02 J      | 1.00 U     |
| JC-0123   | residential   |          |        | Dittmer     | 38.20612  | -90.76114             | <57         | 42    | 93.5  | 87.6  | 48.3  | <56   | 77.4 |     |    |                              |          |                | well             | 3210-118 | 1.00 UJ     | 1.00 U     |
| JC-0124   | residential   |          |        | Dittmer     | 38.19366  | -90.69997             | not sampled |       |       |       |       |       |      |     |    |                              |          |                |                  |          |             |            |
| JC-0125   | residential   |          |        | DeSoto      | 38.1339   | -90.60081             | <70.0       | <60.0 | 63    | 147   | 462   | 399   |      |     |    |                              |          |                | well             | 3209-120 | 3.14 J      | 1.00 U     |
| JC-0126   | residential   |          |        | Festus      | 38.10645  | -90.92704             | <53.0       | 78    | <57.0 | <57.0 | <66.0 | <58.0 |      |     | C2 | 3222-009                     | 24.9     | well           | 3222-109         | 3.13     | 1.51        |            |
| JC-0127   | residential   |          |        | DeSoto      | 38.17693  | -90.43253             | 72          | 57    | 55    | 68    | 101   | 52    | 57   |     | C4 | 3222-010                     | 48.6     | well           | 3210-119         | 1.00 U   | 1.00 U      |            |
| JC-0128   | residential   |          |        | DeSoto      | 38.167245 | -90.73184             | 110         | 429   | 149   | 183   | 88    |       |      |     | C2 | 3222-011                     | 426      | well           | 3222-110         | 1.00 U   | 1.00 U      |            |
| JC-0129   | residential   |          |        | Dittmer     | 38.16614  | -90.74201             | 89          | 44    | <54   | 75    | 83    | 60    | 43   |     |    |                              |          |                | well             | 3222-113 | 1.00 U      | 1.00 U     |
| JC-0130   | residential   |          |        | DeSoto      | 38.10854  | -90.5033              | 59          | 58    | 63.2  | 73    | 70    | 66    | <73  |     |    |                              |          |                | public well      | 3222-111 | 5.88        | 1.00 U?    |
| JC-0131   | residential   |          |        | Hillsboro   |           |                       | not sampled |       |       |       |       |       |      |     |    |                              |          |                |                  |          |             |            |
| JC-0132   | residential   |          |        | DeSoto      | 38.15439  | -90.68978             | 454         | 420   | 398   | 384   | 498   |       |      |     | C2 | 3222.17                      | 46.3     | well           | 3222-112         | 82.8     | 1.00 U      |            |
| JC-0132.1 | source        |          |        | DeSoto      | 38.1546   | -90.69598             | 7579        |       |       |       |       |       |      |     |    |                              |          |                |                  |          |             |            |
| JC-0132.2 | source        |          |        | DeSoto      | 38.154    | -90.69598             | 7549        |       |       |       |       |       |      |     |    |                              |          |                |                  |          |             |            |
| JC-0133   | residential   |          |        | Festus      | 38.24225  | -90.45435             | <60.0       | 31.5  | <58.0 | 107   |       |       |      |     | C4 | 3222-012                     | 43.4     | no well        |                  |          |             |            |
| JC-0134   | residential   |          |        | Festus      | 38.24375  | -90.44865             | 69          | 42    | 60    | 32    |       |       |      |     | C1 | 3210-011                     | 56.8     | no well        |                  |          |             |            |



Table 2: Summary of Screening and Sampling Results  
Jefferson County Lead Site

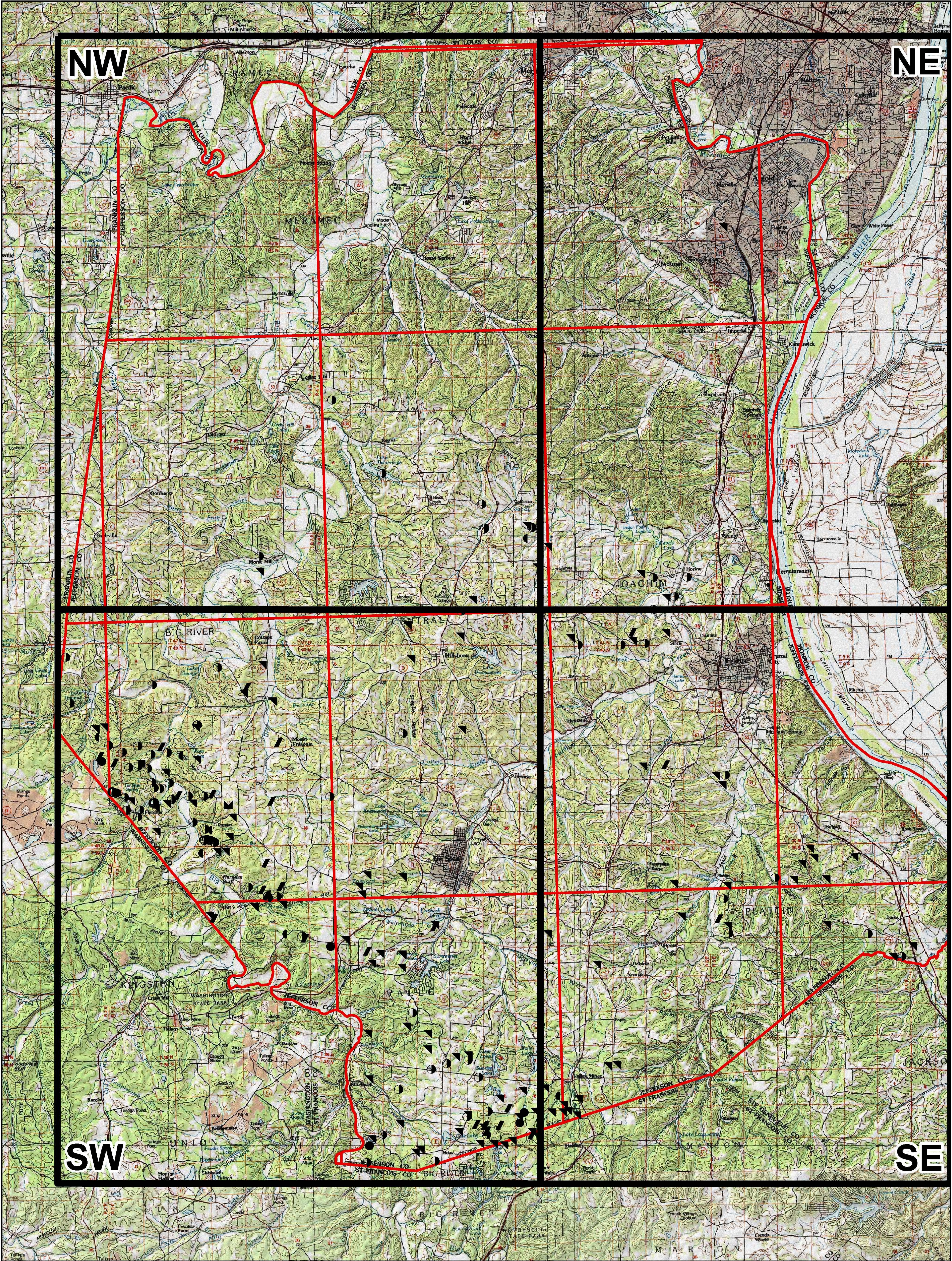
| EPA ID # | Property Type | Location |        | Coordinates |          | XRF Screening Results |             |       |      |       |       |     |     |    | Laboratory Confirmation Data |      |          | Water samples  |         |          |             |            |
|----------|---------------|----------|--------|-------------|----------|-----------------------|-------------|-------|------|-------|-------|-----|-----|----|------------------------------|------|----------|----------------|---------|----------|-------------|------------|
|          |               | Street   | Number | City        | Lat      | Long                  | C1          | C2    | C3   | C4    | C5    | C6  | C7  | C8 | C9                           | cell | number   | result (mg/kg) | type    | number   | Lead (µg/L) | Cad (µg/L) |
| JC-0135  | surface water |          |        |             | 38,21715 | -90,44035             | 48          |       |      |       |       |     |     |    |                              |      |          |                | creek   | 3210-120 | 1.51 J      | 1.00 U     |
| JC-0136  | residential   |          |        | Fletcher    | 38,16174 | -90,68102             | <57.0       | <53.0 | 58.1 | <56.0 | <51.0 |     |     |    |                              | C3   | 3210-12  | 80.2           | well    | 3209-122 | 1.24        | 1.00 U     |
| JC-0137  | residential   |          |        | DeSoto      | 38,16886 | -90,68632             | 38          | <48   | <43  | <51   | <52   |     |     |    |                              |      |          |                | well    | 3209-123 | 1.00 U      | 1.00 U     |
| JC-0138  | residential   |          |        | Dittmer     | 38,20375 | -90,75471             | 621         | 265   | 149  | 149   | 8340  |     |     |    |                              |      | 3210-013 | 2270           | well    | 3210-121 | 71.8 U      | 1.00 U     |
| JC-0139  | residential   |          |        | DeSoto      | 38,16933 | -90,68683             | 58          | <43   | <48  | <52   |       |     |     |    |                              | C1   | 3209-010 | 49.3           | well    | 3209-121 | 6.16        | 1.00 U     |
| JC-0140  | residential   |          |        | Dittmer     | 38,1993  | -90,75992             | 663         | 176   | 41.6 | 48    | 56    | 46  | 84  |    |                              |      |          |                | well    | 3210-122 | 1.00 UJ     | 1.00 U     |
| JC-0141  | residential   |          |        | Fletcher    | 38,16433 | -90,73244             | <59.0       | 173   | 101  | 109   | <58.0 |     |     |    |                              |      |          |                | well    | 3210-123 | 1.00 UJ     | 1.00 U     |
| JC-0142  | residential   |          |        | DeSoto      | 38,15717 | -90,67472             | 37          | <47   | 42   | 104   | 50    | <53 | <46 | 63 | 49                           | C4   | 3210-014 | 50.6           | well    | 3209-124 | 71.8 U      | 1.00 U     |
| JC-0143  | residential   |          |        | Fletcher    | 38,16634 | -90,73573             | 102         | 103   | 152  | 82    | 136   |     |     |    |                              |      |          |                | well    | 3210-124 | 1.00 UJ     | 1.11 J     |
| JC-0144  | residential   |          |        | Festus      | 38,24204 | -90,45435             | 80          | 63    | 75   | 56    | 75    | 82  |     |    |                              | C6   | 3222-013 | 64             | no well |          |             |            |
| JC-0145  | residential   |          |        | DeSoto      | 38,13404 | -90,65646             | <52         | 52    | <51  | 412   |       |     |     |    |                              |      |          |                | well    | 3222-114 | 1.00 U      | 1.00 U     |
| JC-0146  | residential   |          |        | Festus      | 38,24214 | -90,45295             | 62.3        | 61.7  | 87.1 | <55.0 | <58.0 |     |     |    |                              | C3   | 3222-014 | 55             | no well |          |             |            |
| JC-0147  | residential   |          |        | Fletcher    | 38,1584  | -90,68154             | 73          | <59   | 90   | 218   | <67   | 81  |     |    |                              |      |          |                | well    | 3222-115 | 6.36        | 1.00 U     |
| JC-0148  | residential   |          |        | Blackwell   |          |                       | not sampled |       |      |       |       |     |     |    |                              |      |          |                |         |          |             |            |
| JC-0149  | Haul Road     |          |        | N/A         | 38,16569 | -90,73492             | 528         | 366   |      |       |       |     |     |    |                              | C2   | 3222-015 | 544            |         |          |             |            |
| JC-0150  | Haul Road     |          |        |             | 38,16348 | -90,67804             | 187         | 262   |      |       |       |     |     |    |                              |      |          |                |         |          |             |            |
| JC-0151  | no property   |          |        |             |          |                       |             |       |      |       |       |     |     |    |                              |      |          |                |         |          |             |            |
| JC-0152  | Haul Road     |          |        |             | 38,01151 | -90,58238             | 85          | 182   |      |       |       |     |     |    |                              |      |          |                |         |          |             |            |

| KEY   |   |
|-------|---|
| 528   | >/ 400 ppm lead (non-time critical action level)      |
| 5403  | >/ 1200 ppm lead (time critical action level)         |
| 51.8  | >/ Maximum Contaminant Level (MCL) for Drinking Water |
| Well  | Impacted Private Well                                 |
| C     | Cell  |
| N/A   | Not applicable  |
| µg/L  | Micrograms per liter                                  |
| mg/kg | Milligrams per kilogram                               |
| XRF   | X-ray fluorescence                                    |
| ppm   | Parts per million                                     |
| EPA   | United States Environmental Protection Agency         |



**APPENDIX B**  
**FIGURES**







U. S. Environmental Protection Agency

LEAD STUDY  
JEFFERSON  
COUNTY, MISSOURI  
Task Order: X9004L060002012

FIGURE 1  
Site Location Map  
with Mining Sites

 Tetra Tech EM Inc.



**OPERATION TYPE**

●

Furnace

⊙

Plant

◻

Smelter

▼

Surface

◻

Surface; Furnace

◼

Surface; Plant

◐

Surface; Underground

●

Tailings Pond

／

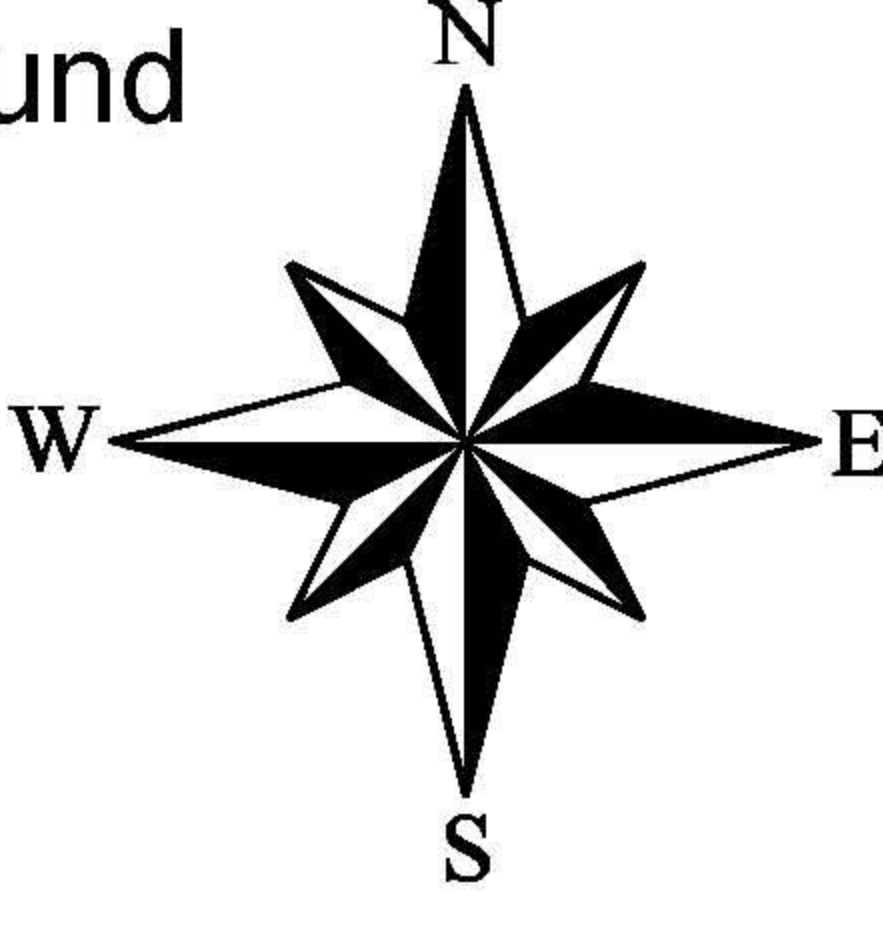
Underground

○

unknown

◻

Jefferson County 7.5 Quads



01.536912

Miles







U. S. Environmental Protection Agency



LEAD STUDY  
JEFFERSON COUNTY, MISSOURI  
Task Order: X9004L060002012

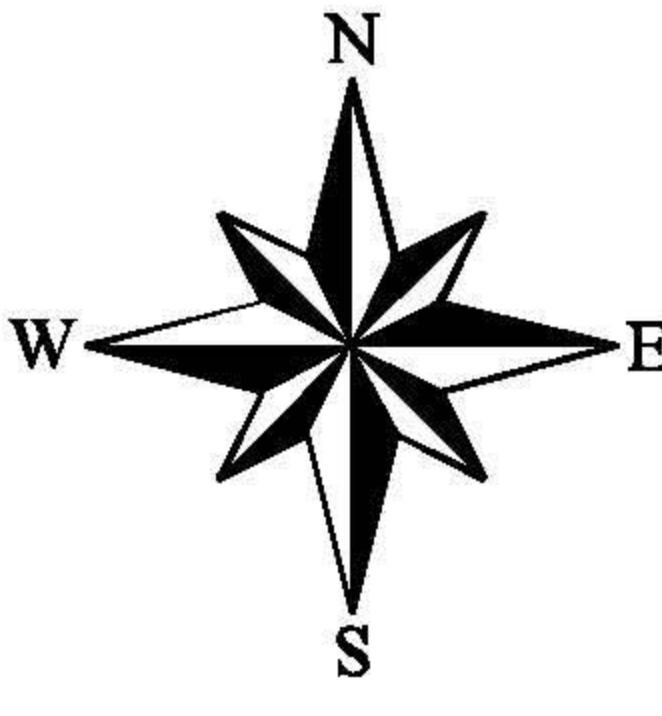
FIGURE 2  
RESIDENTIAL LOCATIONS  
LEAD >= 400






### Legend

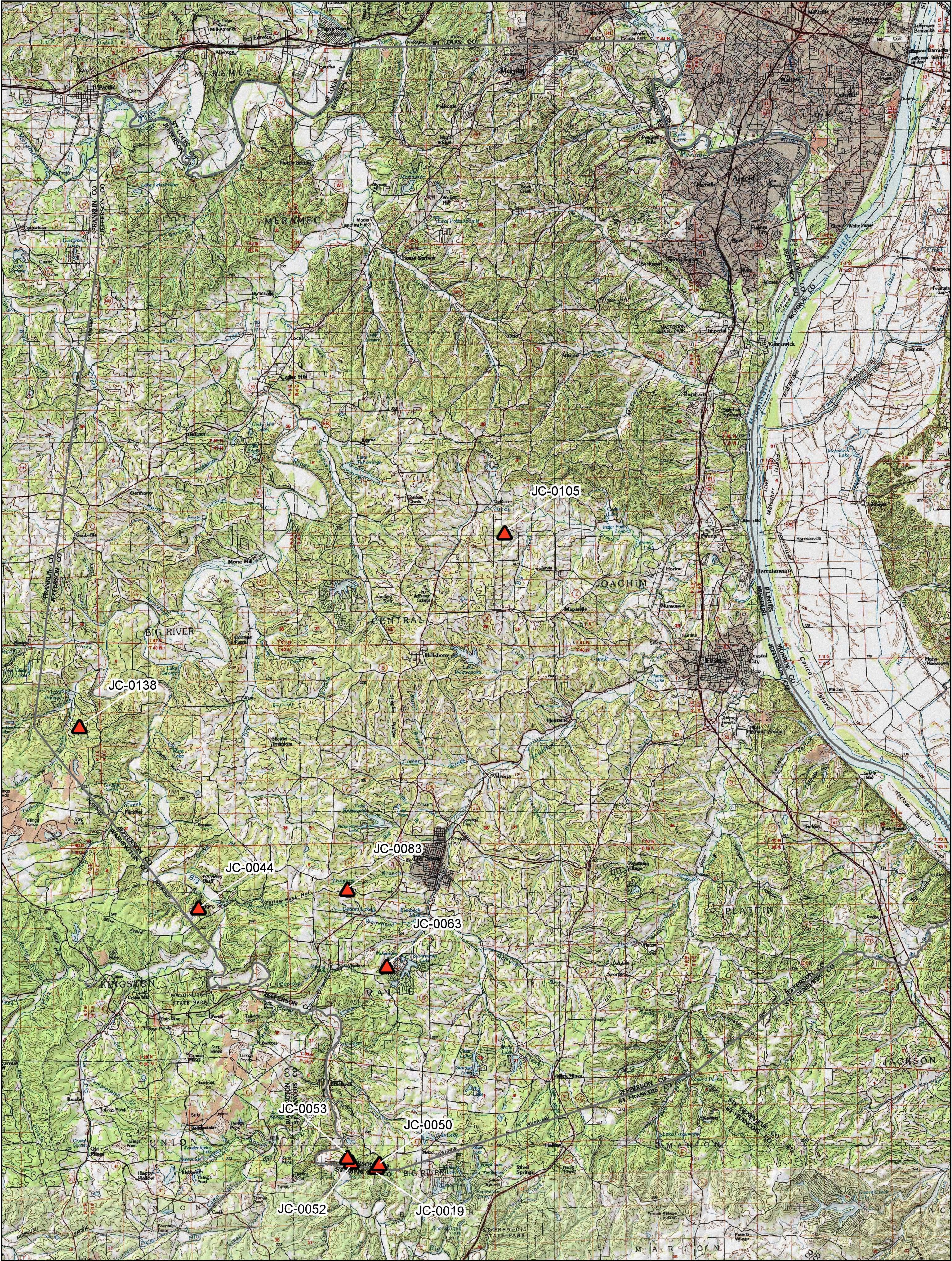
-  Lead >= 400
-  Jefferson County





0 3 6 12 Miles







U. S. Environmental Protection Agency


LEAD STUDY  
JEFFERSON  
COUNTY, MISSOURI  
Task Order: X9004L060002012


FIGURE 3  
RESIDENTIAL LOCATIONS  
LEAD >= 1200

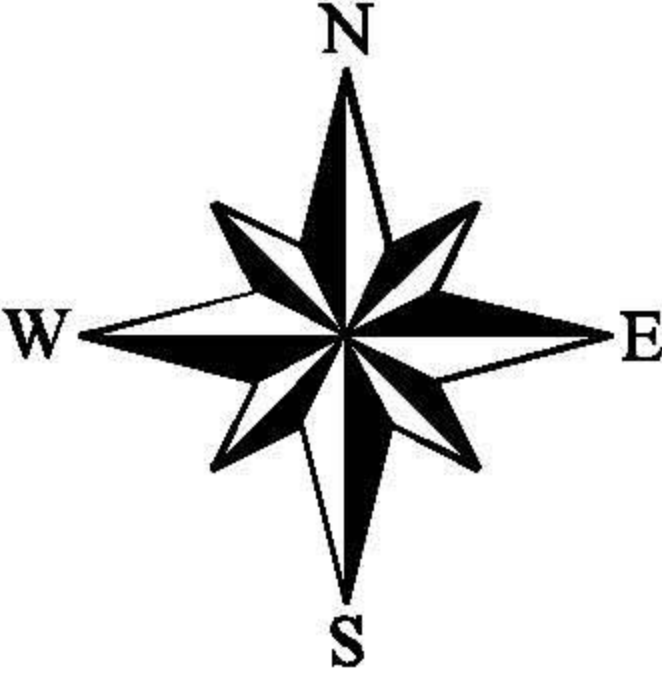
 Tetra Tech EM Inc.



Legend

 Lead >= 1200

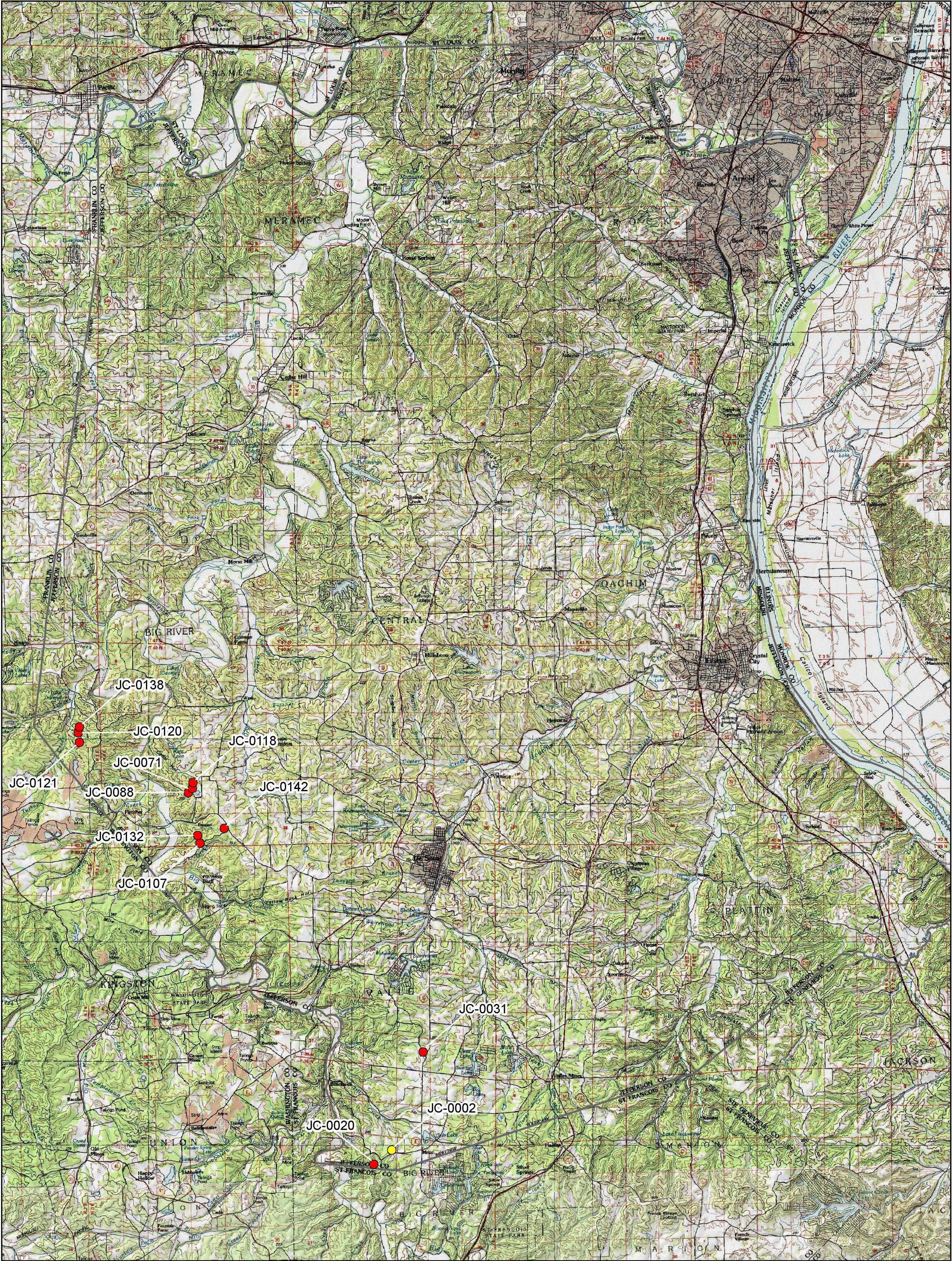
 Jefferson County



03612

Miles







U. S. Environmental Protection Agency

LEAD STUDY  
JEFFERSON  
COUNTY, MISSOURI  
Task Order: X9004L060002012


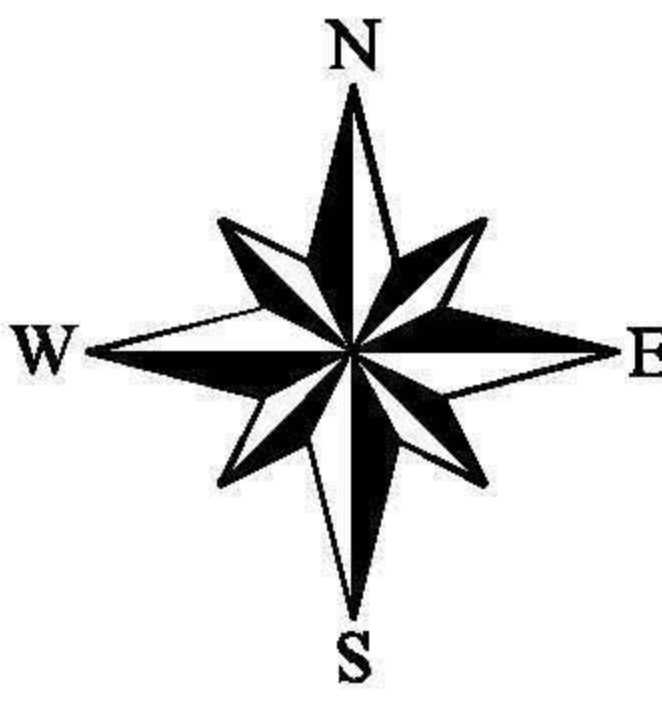
FIGURE 4  
Impacted Private Wells





### Legend

- Wells > MCL Lead
- Wells > MCL Cadmium
- Jefferson County









U. S. Environmental Protection Agency

LEAD STUDY  
JEFFERSON  
COUNTY, MISSOURI  
Task Order: X9004L060002012

FIGURE 5  
NON RESIDENTIAL  
SAMPLE LOCATIONS &  
RESULTS

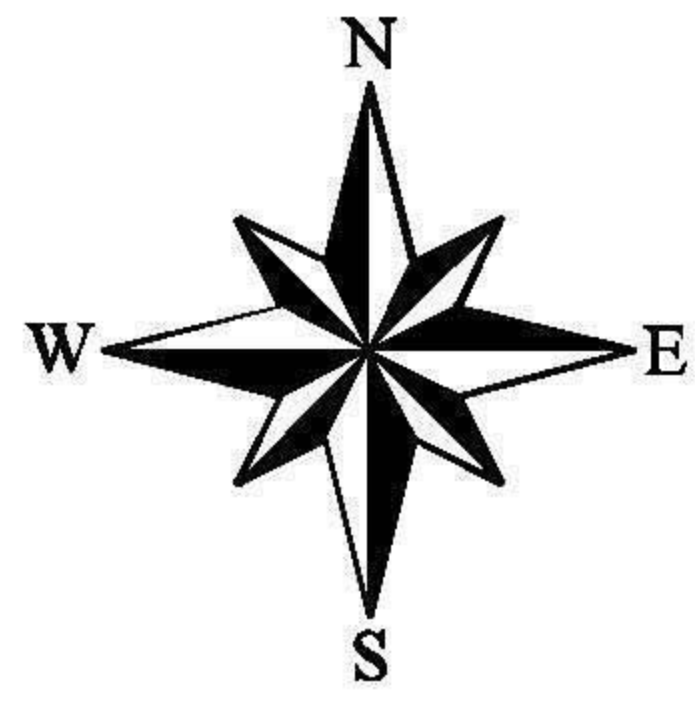


Tetra Tech EM Inc.



**Legend**

- ▲ Source Area < 400 ppm
- ▲ Source Area > 400 ppm
- Haul Roads < 400 ppm
- Haul Roads > 400 ppm
- Sediment < 400 ppm
- Sediment > 400 ppm
- ◆ Surface Water < MCLs
- ◆ Surface Water > MCLs

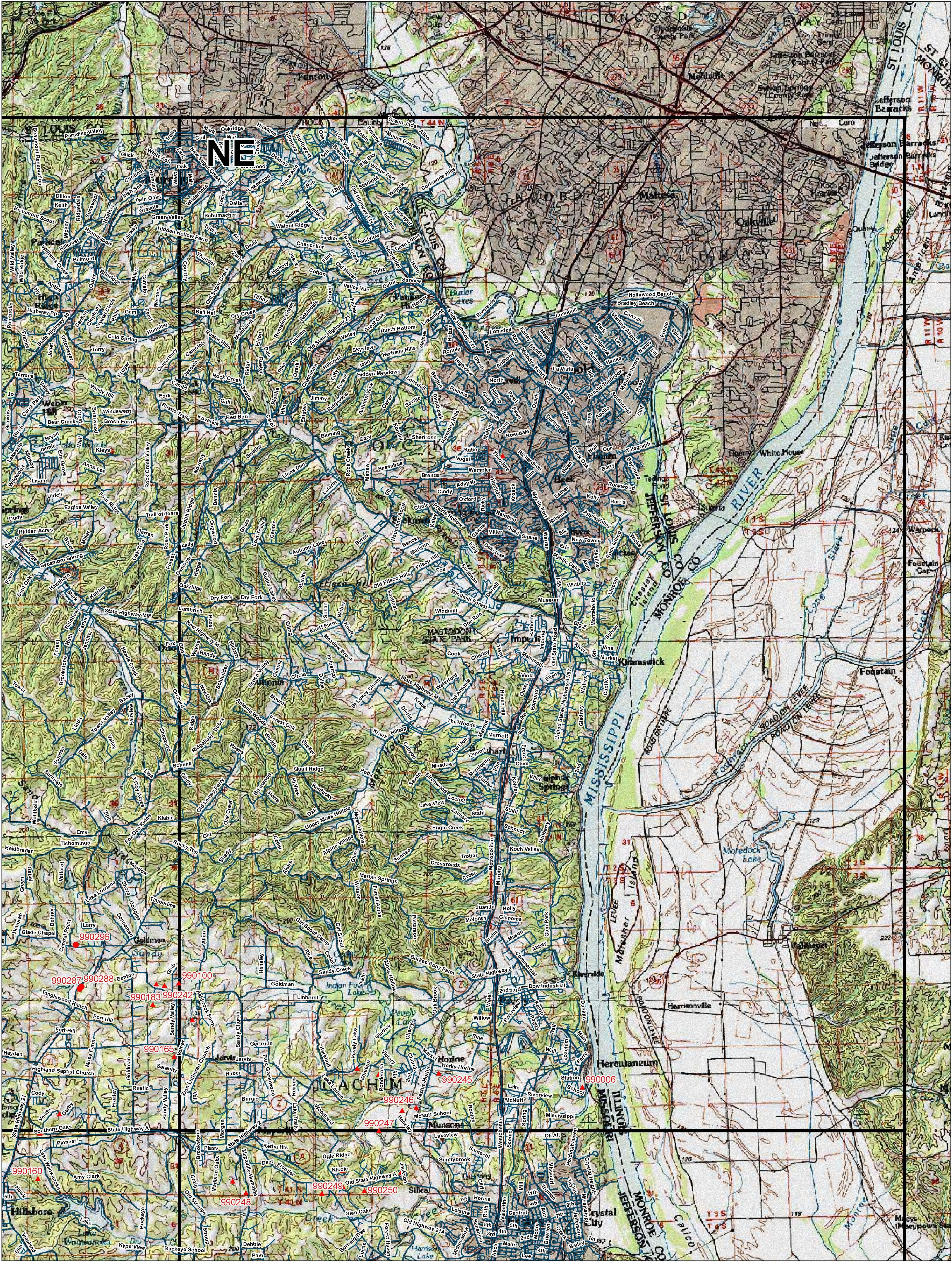


0 1.5 3 6 Miles



**APPENDIX C**  
**DETAILED MINE LOCATION MAPS OF JEFFERSON COUNTY**







U. S. Environmental Protection Agency

LEAD STUDY  
JEFFERSON  
COUNTY, MISSOURI  
Task Order: X9004L060002012

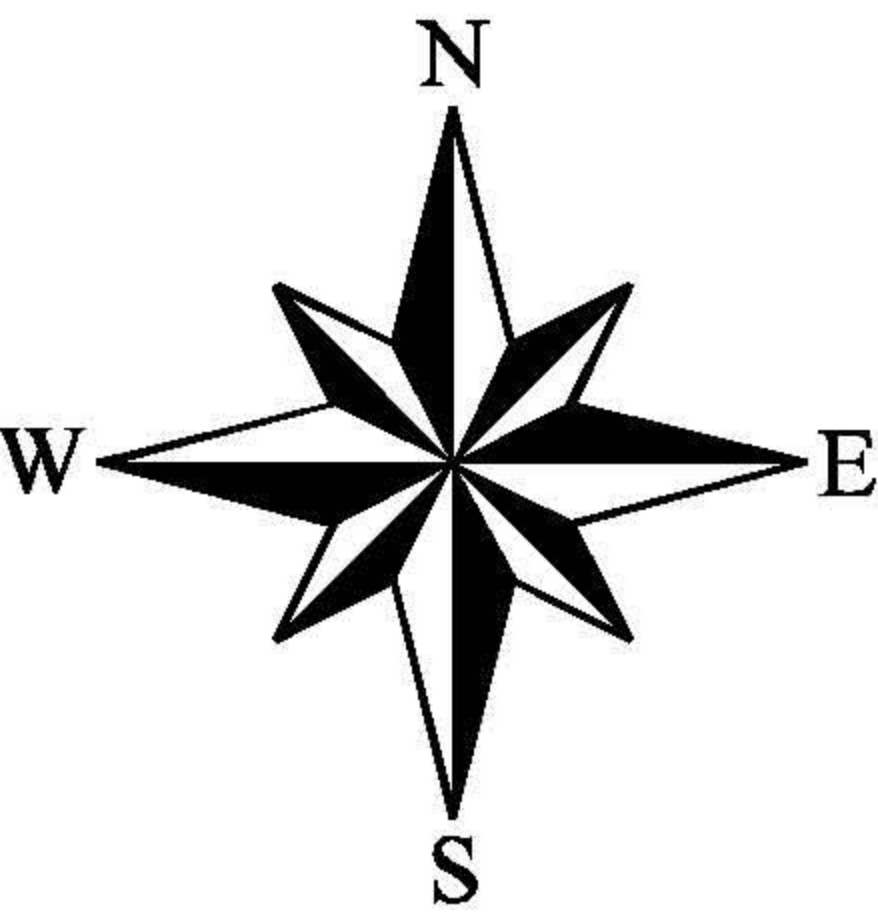
MINE LOCATION AND TYPE  
NORTHEAST

 Tetra Tech EM Inc.



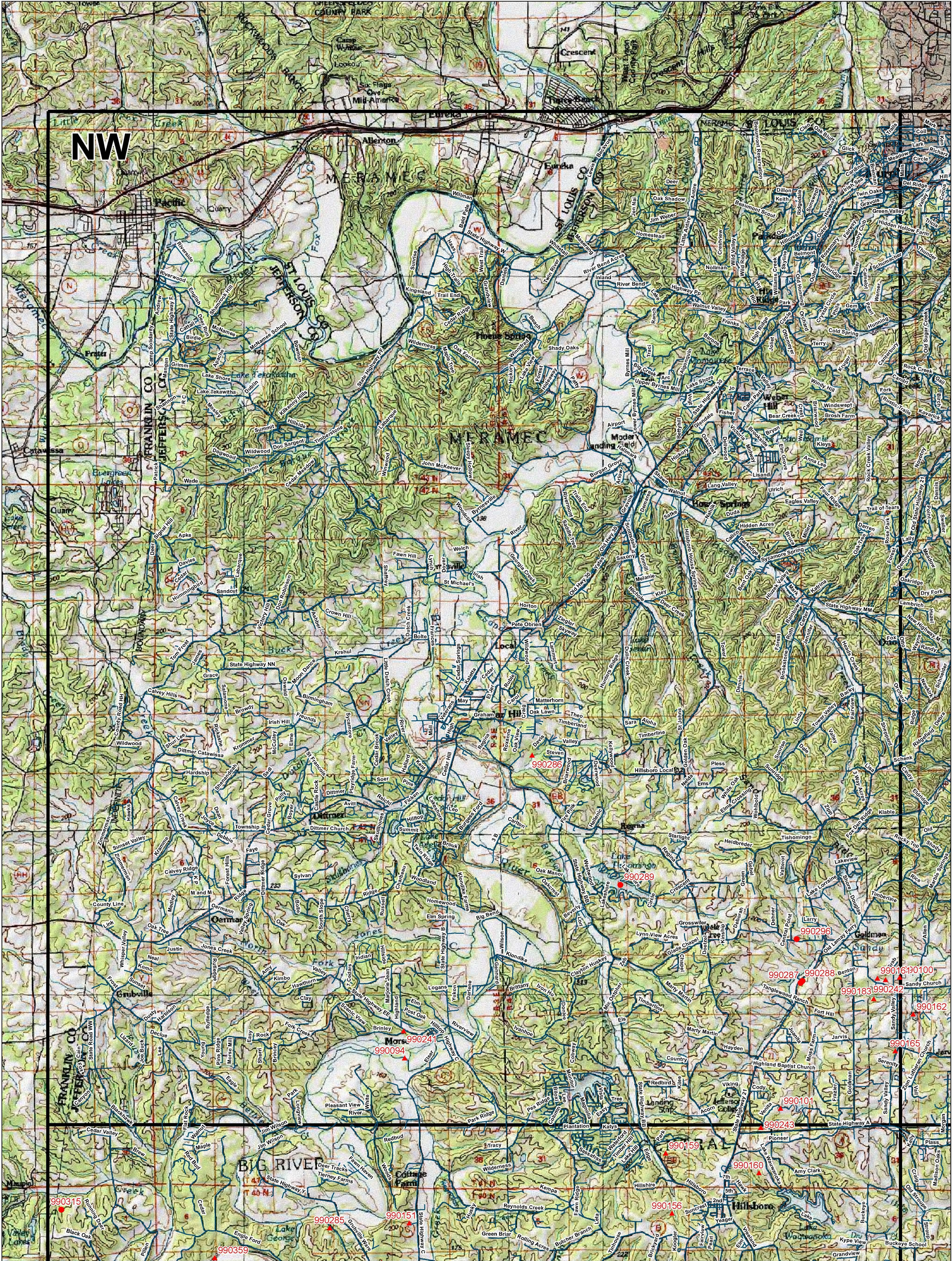
### Legend

- Copper
- Barium and misc
- ▲ Lead and misc
- ◆ Zinc and misc
- Jefferson County Roads



0 0.5 1 2 3 4 Miles







U. S. Environmental Protection Agency

LEAD STUDY  
JEFFERSON  
COUNTY, MISSOURI  
Task Order: X9004L060002012

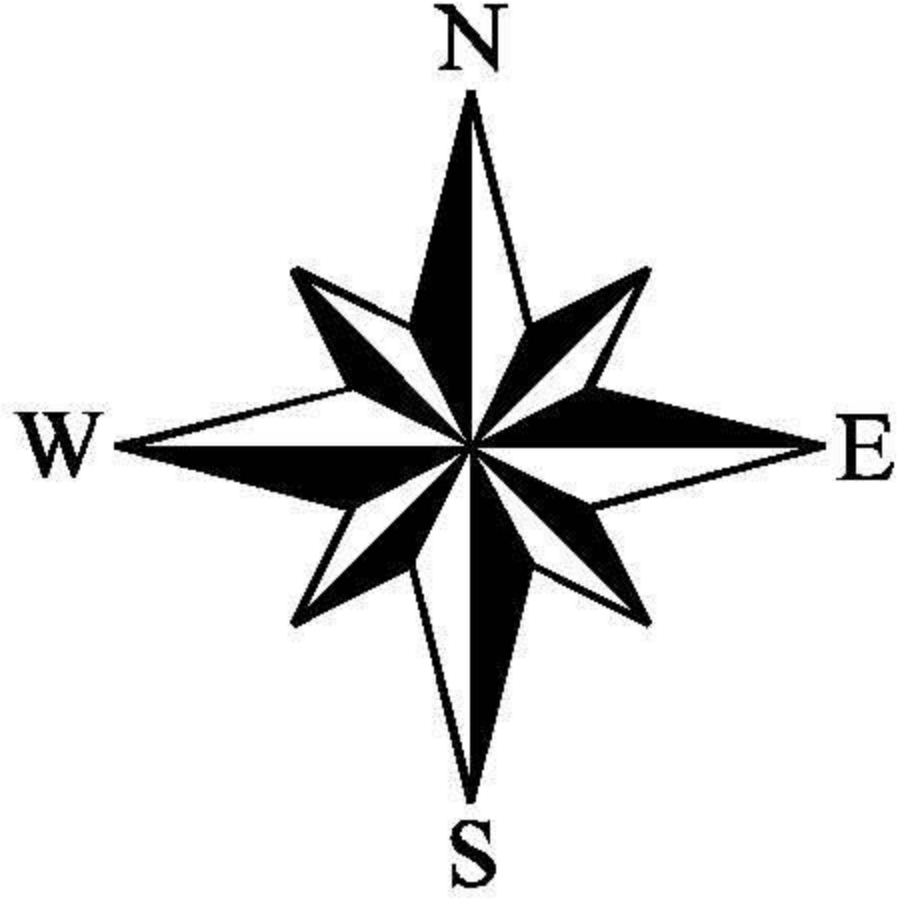
MINE LOCATION AND TYPE  
NORTHWEST






### Legend

- Copper
- Barium and misc
- ▲ Lead and misc
- ◆ Zinc and misc
- Jefferson County Roads



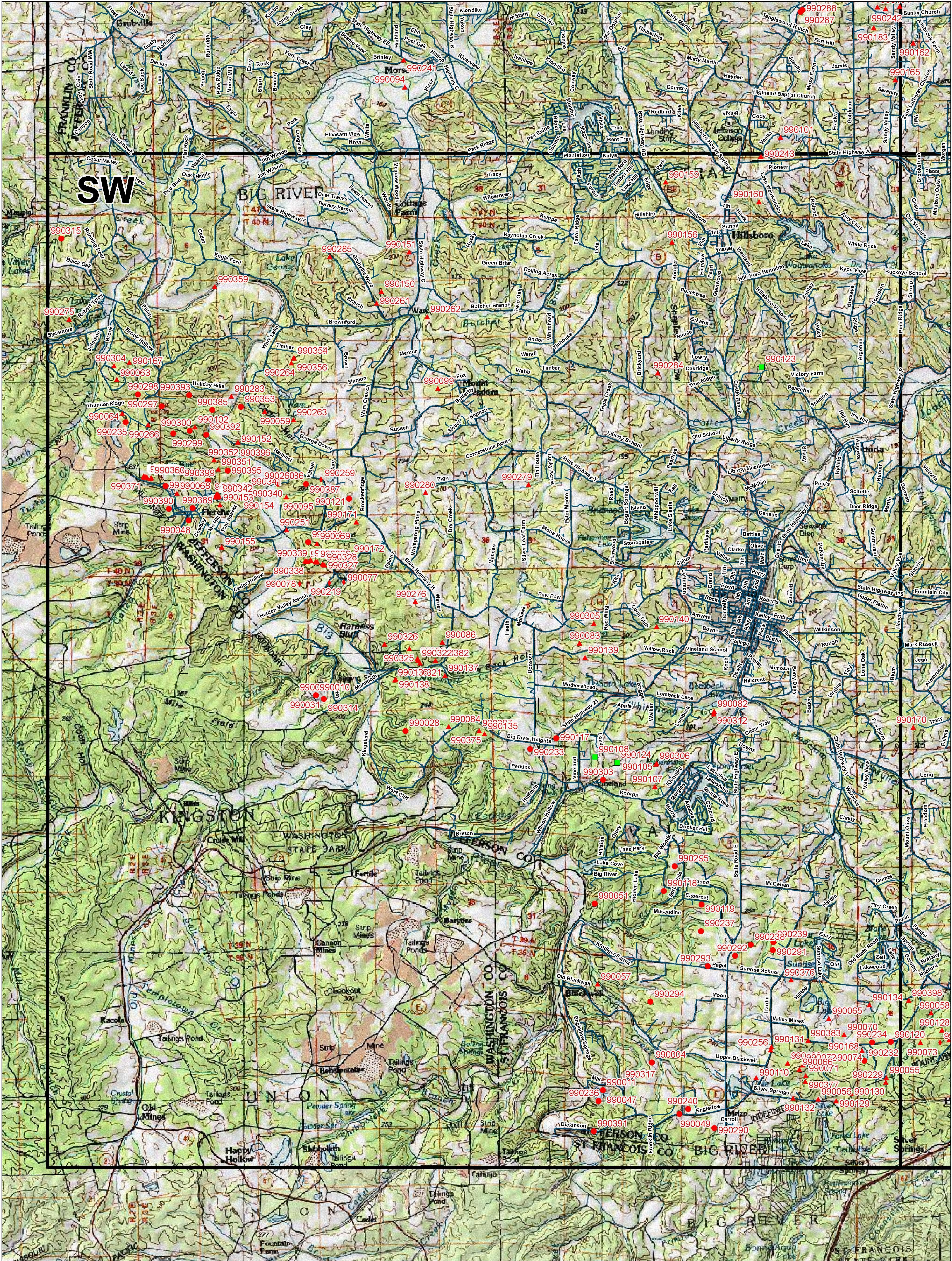
0 0.5 1 2 3 4 Miles













U. S. Environmental Protection Agency

LEAD STUDY  
JEFFERSON  
COUNTY, MISSOURI  
Task Order: X9004L060002012

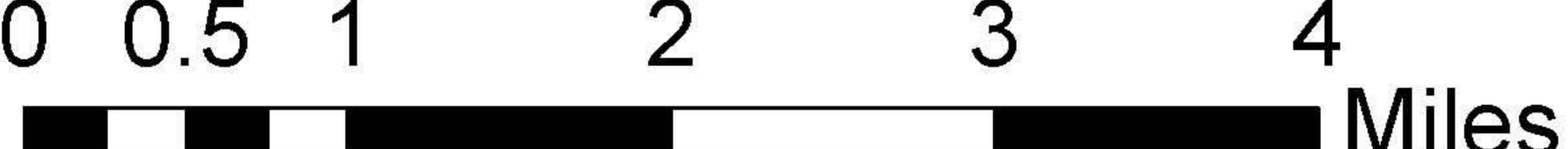
MINE LOCATION AND TYPE  
SOUTHWEST

 Tetra Tech EM Inc.

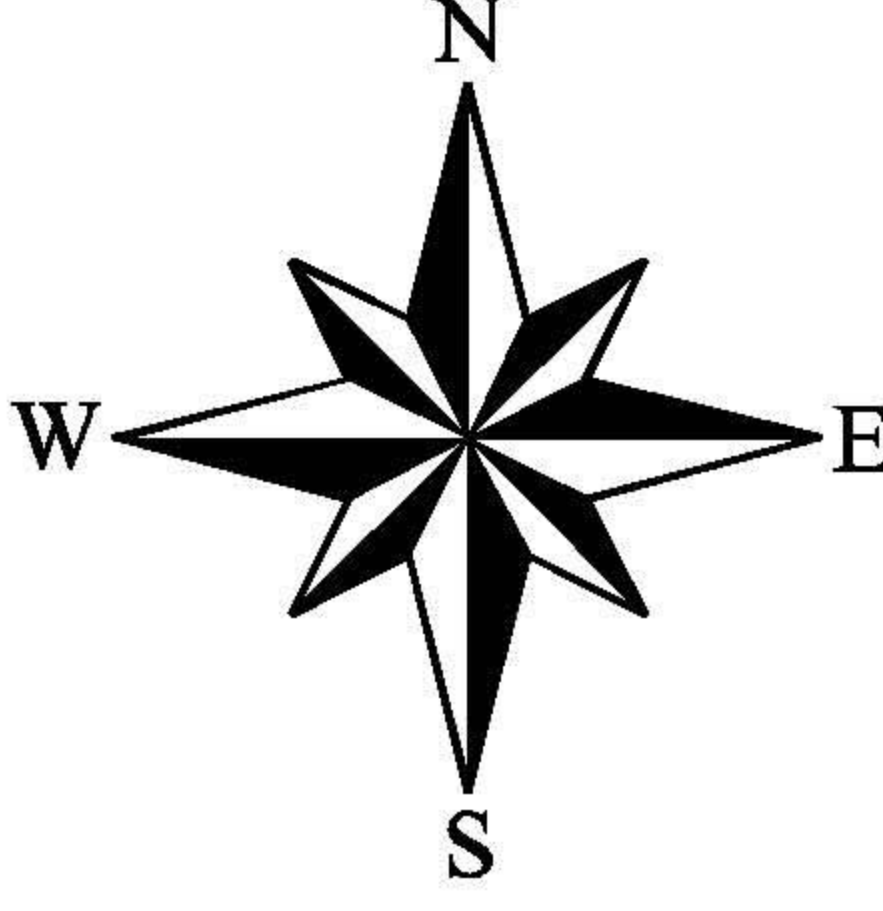


### Legend

- Copper
- Barium and misc
- ▲ Lead and misc
- ◆ Zinc and misc
- Jefferson County Roads



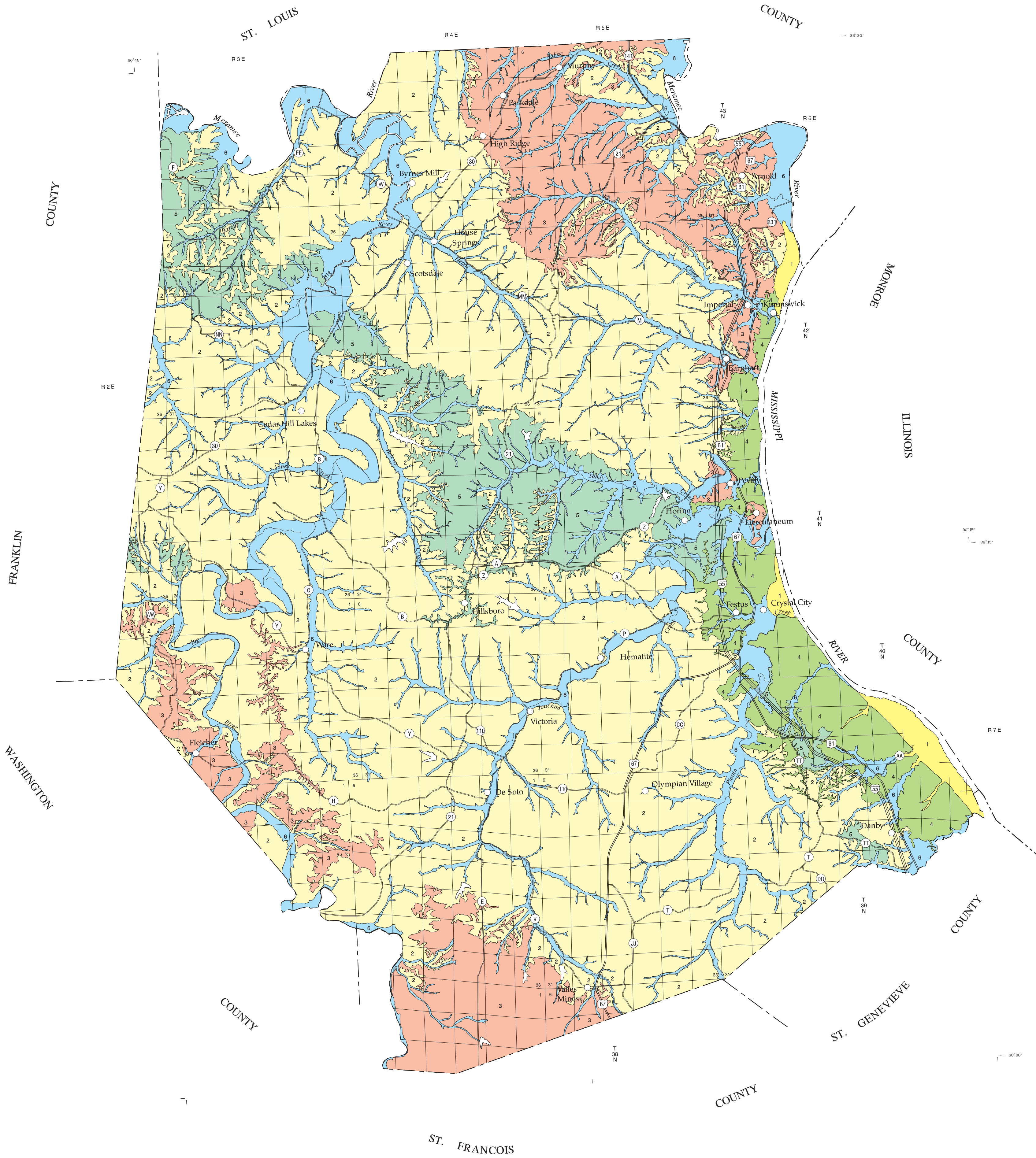
0 0.5 1 2 3 4 Miles





**APPENDIX D**  
**GENERAL SOIL MAP OF JEFFERSON COUNTY**



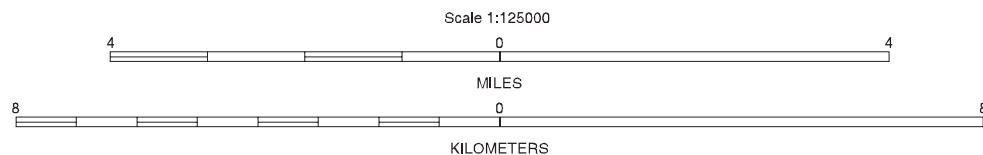


SOIL LEGEND\*

- 1 Haynie-Tice-Waldron Association
- 2 Sonsac-Useful-Moko Association
- 3 Wrengart-Goss Association
- 4 Menfro-Gasconade Association
- 5 Minnith-Pevely Association
- 6 Haymond-Freeburg-Horsecreek-Bloomsdale Association

\*The units on this legend are described in the text under the heading "General Soil Map Units."  
Compiled 2000

UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE  
In Cooperation with  
JEFFERSON COUNTY SOIL AND WATER CONSERVATION DISTRICT  
MISSOURI DEPARTMENT OF NATURAL RESOURCES  
MISSOURI AGRICULTURAL EXPERIMENT STATION  
MISSOURI DEPARTMENT OF CONSERVATION  
**GENERAL SOIL MAP**  
**JEFFERSON COUNTY, MISSOURI**



| SECTIONALIZED TOWNSHIP |    |    |    |    |    |
|------------------------|----|----|----|----|----|
| 6                      | 5  | 4  | 3  | 2  | 1  |
| 7                      | 8  | 9  | 10 | 11 | 12 |
| 18                     | 17 | 16 | 15 | 14 | 13 |
| 19                     | 20 | 21 | 22 | 23 | 24 |
| 30                     | 29 | 28 | 27 | 26 | 25 |
| 31                     | 32 | 33 | 34 | 35 | 36 |



**APPENDIX E**  
**PHOTOGRAPHIC DOCUMENTATION**



**Jefferson County Lead Site  
Jefferson County, Missouri**



|  |              |   |         |
|--|--------------|---|---------|
| TETRA TECH<br>PROJECT NO.<br>X9004.L06.0002012<br><br>Direction: Southwest | DESCRIPTION  | This photograph shows lead mining mill remnants in Valles Mines, Missouri | 1       |
|  | CLIENT       | Environmental Protection Agency Region 7                                  | Date    |
|  | PHOTOGRAPHER | Joe Parish  | 8/14/06 |



|  |              |  |         |
|--|--------------|--|---------|
| TETRA TECH<br>PROJECT NO.<br>X9004.L06.0002.012<br><br>Direction: East | DESCRIPTION  | This photograph shows tailings pile from milling operation in Valles Mines, Missouri | 2       |
|  | CLIENT       | Environmental Protection Agency Region 7   | Date    |
|  | PHOTOGRAPHER | Joe Parish   | 8/15/06 |



**Jefferson County Lead Site  
Jefferson County, Missouri**



|   |              |   |         |
|---|--------------|---|---------|
| TETRA TECH<br>PROJECT NO.<br>X9004.L06.0002012<br><br>Direction: East | DESCRIPTION  | This photograph shows chat piles from tiff mining at Engledow & Dickinson Roads, De Soto, Missouri. | 3       |
|   | CLIENT       | Environmental Protection Agency Region 7  | Date    |
|   | PHOTOGRAPHER | Joe Parish  | 8/15/06 |



|   |              |  |         |
|---|--------------|--|---------|
| TETRA TECH<br>PROJECT NO.<br>X9004.L06.0002.012<br><br>Direction: Southeast | DESCRIPTION  | This photograph shows workings at tiff mine site 990240 off of Engledow Road, De Soto, Missouri. | 4       |
|   | CLIENT       | Environmental Protection Agency Region 7   | Date    |
|   | PHOTOGRAPHER | Joe Parish   | 8/21/06 |



**Jefferson County Lead Site  
Jefferson County, Missouri**



|  |              |  |         |
|--|--------------|--|---------|
| TETRA TECH<br>PROJECT NO.<br>X9004.L06.0002012<br><br>Direction: Southwest | DESCRIPTION  | This photograph shows the Big River south sample collection point. | 5       |
|  | CLIENT       | Environmental Protection Agency Region 7                           | Date    |
|  | PHOTOGRAPHER | Joe Parish   | 8/31/06 |



|   |              |  |         |
|---|--------------|--|---------|
| TETRA TECH<br>PROJECT NO.<br>X9004.L06.0002.012<br><br>Direction: North | DESCRIPTION  | This photograph shows apparent workings at mine site 990293 northwest of Valles Mines, Missouri. | 6       |
|   | CLIENT       | Environmental Protection Agency Region 7   | Date    |
|   | PHOTOGRAPHER | Joe Parish   | 8/31/06 |



**Jefferson County Lead Site  
Jefferson County, Missouri**



|  |                     |   |          |
|--|---------------------|---|----------|
| <b>TETRA TECH<br/>PROJECT NO.</b><br>X9004.L06.0002012<br><br>Direction: Northwest | <b>DESCRIPTION</b>  | This photograph shows mine tailings off of Hidden Valley Ranch Road in De Soto, Missouri. | 7        |
|  | <b>CLIENT</b>       | Environmental Protection Agency Region 7  | Date     |
|  | <b>PHOTOGRAPHER</b> | Joe Parish  | 10/26/06 |



|   |                     |   |          |
|---|---------------------|---|----------|
| <b>TETRA TECH<br/>PROJECT NO.</b><br>X9004.L06.0002.012<br><br>Direction: Southeast | <b>DESCRIPTION</b>  | This photograph shows a mine shaft off of Hidden Valley Ranch Road. | 8        |
|   | <b>CLIENT</b>       | Environmental Protection Agency Region 7                            | Date     |
|   | <b>PHOTOGRAPHER</b> | Joe Parish  | 10/26/06 |



**“Appendix F not submitted”**



**“Appendix G not submitted”**



**APPENDIX H**  
**REGION 7 SUPERFUND PRE-CERCLIS SCREENING FORM**



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

|  |   |                   |
|--|---|-------------------|
| <b>I. SITE NAME AND LOCATION:</b>  |   |                   |
| <b>NAME:</b> Jefferson County, Missouri  |   |                   |
| <b>ADDRESS OR OTHER LOCATION IDENTIFIER:</b> Field office at 914 Dale  |   |                   |
| <b>CITY:</b> Jefferson County  | <b>STATE:</b> MO  | <b>ZIP:</b> 63048 |
| <b>DIRECTIONS TO SITE:</b> Jefferson County is located in southeastern Missouri. It is bordered on the north by St. Louis County and the Meramec River, on the east by the Mississippi River, on the south by St. Genevieve and St. Francis Counties, and on the west by Washington and Franklin Counties. <b>MAP ATTACHED:</b> See Figure 1 with Pre-CERCLIS Site Screening Report  |   |                   |
| <b>II. PROGRAM CONTACTS:</b>   |   |                   |
| <b>REQUESTED BY:</b> James Silver  | <b>DATE OF REQUEST:</b> 7/11/06   |                   |
| <b>AGENCY/OFFICE:</b> Environmental Protection Agency/Region 7 Superfund Division  |   |                   |
| <b>MAILING ADDRESS:</b> 212 Little Bussen Drive  |   |                   |
| <b>CITY:</b> Kansas City   | <b>STATE:</b> Missouri  | <b>ZIP:</b> 63026 |
| <b>TELEPHONE:</b> (636) 326-4724   | <b>FAX:</b> (636) 326-4720  |                   |
| <b>EVALUATOR:</b> Joe Parish   |   |                   |
| <b>AGENCY/OFFICE:</b> Tetra Tech EM Inc.   |   |                   |
| <b>MAILING ADDRESS:</b> 11116 South Towne Square   |   |                   |
| <b>CITY:</b> St. Louis   | <b>STATE:</b> MO  | <b>ZIP:</b> 63123 |
| <b>TELEPHONE:</b> (314) 892-6322   | <b>FAX:</b> (314) 892-6132  |                   |
| <b>III. SITE INFORMATION:</b>  |   |                   |
| <b>TYPE OF FACILITY:</b> Residential and commercial properties near former mining areas  | <b>TYPE OF OWNERSHIP:</b> Various   |                   |
| <b>OWNER/OPERATOR INFORMATION:</b> Various   |   |                   |
| <b>SITE STATUS (active/inactive):</b> Mining operations are inactive   | <b>YEARS OF OPERATION:</b> Mining operations in the area were conducted from the early 1800s to the 1970s |                   |
| <b>OPERATIONAL HISTORY: (How was the site identified?)</b><br><br><p>Mining activities in Jefferson County began in the early 1800s in Southern Jefferson County where the Cambrian dolomite source rock is concentrated along Big River and other major streams. The IMOP database lists 253 historical sites associated with mining and production operations in Jefferson County. Of these, 202 of the mining sites were designated for lead or lead and other commodities, particularly zinc and barium (tiff). Doe Run is the only listed current operator in Jefferson County. Doe Run's smelter was opened in 1892 by its predecessor, the St. Joe Lead Company. As of 2003, the Doe Run Smelter was producing over 100,000 tons of lead a year. The Valle Mining company is also still in business, but is no longer mining for lead. According to historical records, the company operated the lead mine and smelting operation at Valles Mines from approximately 1824 through the 1930s. The ruins of several ore milling structures, former smelter, chat piles, and mill wastes are still present in the vicinity of Valle Mines.</p> <p>Past barium (tiff) producers included Dresser Minerals, General Barite Company, Desoto Mining Company, and Scott &amp; Whaley. Dresser Minerals was the largest producer of barium, and according to local residences, moved its operations overseas in the 1970s. Historical records indicate that the earliest tiff mines were in operation in the 1830s, and ceased circa 1975.</p> |   |                   |



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

### IV. PRE-CERCLIS SCREENING ASSESSMENT CHECKLIST/DECISIONS

(Criteria from "Improving Site Assessment: Pre-CERCLIS Screening Assessments," OSWER Directive #9375.2-11FS, EPA-540-F-98-039, PB98-963310, October 1999)

1. Does the site already appear in CERCLIS? YES ☐ or NO ☒

(If YES, this form may be inappropriate to document site decisions, i.e., a CERCLA PA (at a minimum) is required.)

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? YES ☐ or NO ☒

(If YES, then explain in Section V.)

3. Does the site consist of a release of a naturally occurring substance in its unaltered form, or solely through naturally occurring processes or phenomena, from a location where it is naturally found? YES ☐ or NO ☒

(If YES, then explain in Section V.)

4. Is the release into a public or private drinking water supply due to deterioration of the system through ordinary use? YES ☐ or NO ☒

(If YES, then explain in Section V.)

5. Is some other program actively involved with the site (i.e., another Federal, State, or Tribal program)? YES ☐ or NO ☒

(If YES, then explain in Section V.)

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)? YES ☐ or NO ☒

(If YES, then explain in Section V.)

7. Are the hazardous substances potentially released at the site excluded by policy considerations (e.g., deferral to RCRA Corrective Action)? YES ☐ or NO ☒

(If YES, then explain in Section V.)

Check one, either 8.a or 8.b, whichever applies

8. a. Is there sufficient documentation that clearly demonstrates that there is no potential for a 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, documentation showing that no hazardous substance releases have occurred, EPA approved risk assessment completed)? YES ☐ or NO ☐

(Explain in Section V.)

8. b. Base on limited sampling that has been performed at/near the site in conjunction with Pre-CERCLIS Screening Assessment, is there a potential for a release that could cause adverse environmental or human health impacts? YES ☒ or NO ☐

(Explain in Section V)

Yes -> Explain in the following Sections whether or not a CERCLA response action (CERCLIS entry) is warranted.

No -> No CERCLIS entry is warranted. Explain in the following Sections.



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

|   |
|---|
| <b>V. SUPERFUND SITE SCREENING CRITERIA</b>   |
| <b>A. REMEDIAL CRITERIA</b>   |
| <b>1. SOURCE AND WASTE CHARACTERISTICS</b>  |
| <b>KNOWN OR SUSPECTED SOURCE TYPES AND LOCATIONS:</b> Mine tailings piles (waste piles)   |
| <b>SIZE OF SOURCES AND QUANTITIES (Volume, Area):</b> 252 sites, quantities unknown   |
| <b>WASTE TYPES OR HAZARDOUS SUBSTANCES KNOWN OR SUSPECTED TO BE PRESENT:</b> Lead, cadmium, and zinc  |
| <b>2. GROUND WATER PATHWAY:</b>   |
| <p><b>What is the likelihood that a release to groundwater has occurred at the site?</b> Laboratory data have indicated a release of lead and cadmium to groundwater has occurred.</p> <p><b>If a release is not suspected proceed to A.3.</b></p>  |
| <b>a. USE AND CHARACTERISTICS:</b>  |
| <b>GENERAL STRATIGRAPHY AND HYDROLOGY:</b>  |
| <b>PRESENCE OF KARST TERRAIN:</b> None identified in the immediate site area  |
| <b>DEPTH TO SHALLOWEST AQUIFER:</b> Approximately 100 feet  |
| <b>PRIVATE WELLS WITHIN 4 MILES (locations and population served):</b> A total of 106 wells have been sampled, and an estimated 200+ more wells may have been impacted by mining activities.  |
| <b>MUNICIPAL WELLS WITHIN 4 MILES (locations and population served):</b> The major towns in Jefferson County have municipal wells. About 15 percent of homes sampled in close proximity to the mining sites were on community wells.  |
| <b>DISTANCE TO NEAREST DRINKING WATER WELL:</b> Within impacted area  |
| <b>WELLHEAD PROTECTION AREAS:</b> Unknown at this time  |
| <b>3. SURFACE WATER PATHWAY:</b>  |
| <p><b>What is the likelihood that a release to surface water has occurred at the site?</b> Sampling of surface water and sediment downgradient of former mining areas has indicated that a release to surface water (namely Big River) has likely occurred. Mining activities are known to have impacted other locations of Big River, which is listed with the MDNR as an impaired water body.</p> <p><b>If a release is not suspected proceed to A.4.</b></p> |
| <b>a. USE AND CHARACTERISTICS:</b>  |
| <b>FLOOD FREQUENCY:</b> Records at Byrnesville, MO have shown 10 major flood crests since 1915, and the river approaches or exceeds flood stage annually.   |
| <b>DISTANCE TO NEAREST SURFACE WATER:</b> Within study area, Big River  |
| <b>SURFACE WATER BODIES WITHIN 15 DOWNSTREAM MILES:</b> Within study area, Big River  |
| <b>DESIGNATED AND/OR PROTECTED USES OF SURFACE WATER BODIES:</b> Recreation, fish consumption, livestock, watering.   |
| <b>DRINKING WATER INTAKES WITHIN 15 DOWNSTREAM MILES (locations and populations served):</b> The MDNR does not list drinking water as one of the river's uses, according to TMDL report from 2006.  |
| <b>FISHERIES WITHIN 15 DOWNSTREAM MILES:</b> Fishing for human consumption is popular all along the river, and is listed as an impaired use according to MDNR TMDL report from 2006.  |
| <b>KNOWN OR POTENTIAL SENSITIVE ENVIRONMENTS AND WETLANDS WITHIN 15 DOWNSTREAM MILES:</b> Warm water aquatic life is threatened according to TMDL report from 2006.   |
| <b>4. SOIL EXPOSURE PATHWAY:</b>  |
| <p><b>What is the likelihood of exposure to hazardous substances at the site?</b> Field screening data and laboratory results have indicated lead concentrations in surface soils exceeding the time-critical removal action of 1,200 ppm at nine of the residences sampled, and exceeding the secondary action level of 400 ppm at 21 of the residences sampled.</p>   |



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

### a. CHARACTERISTICS:

**NUMBER OF PEOPLE LIVING WITHIN 200 FEET:** The population of the County is 198,099 as of the 2000 census. Population close to mining sites is unknown.

**SCHOOLS OR DAY-CARES WITHIN 200 FEET:** Within study area, one school property was sampled.

**POPULATIONS WITHIN 1 MILE:** The population of the county is 198,099 as of the 2000 census. Population close to mining sites is unknown.

**NUMBER OF WORKERS AT THE FACILITY OR ADJACENT FACILITIES WHOSE CONTAMINATION IS SUSPECTED:** Unknown

**LOCATIONS OF KNOWN OR POTENTIAL TERRESTRIAL SENSITIVE ENVIRONMENTS:** None known

### 5. AIR PATHWAY:

**What is the likelihood that hazardous substances are migrating from the site to the air?** Airborne lead-contaminated particulates from tailings may be a contaminant migratory mechanism, but not suspected to be a direct exposure threat.

**If a release is not suspected proceed to B.**

### a. CHARACTERISTICS

**POPULATIONS WITHIN 4 MILES** Within study area

**DISTANCE TO NEAREST INDIVIDUAL:** Within study area

**LOCATIONS OF KNOWN OR POTENTIAL SENSITIVE ENVIRONMENTS WITHIN 0 TO 1/4 MILE AND 1/4 TO 1/2 MILE:** None known.

### B. REMOVAL CRITERIA

**IS THERE A RELEASE AS DEFINED BY THE NCP?**

YES ☒ or NO ☐

**EXPLAIN:** Laboratory results have indicated lead concentrations in private drinking water wells exceeding the action level of 15 ug/L, and in residential soils exceeding the time-critical removal action of 1,200 ppm.

*(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 300.410(e)])*

**IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP?**

YES ☒ or NO ☐

**EXPLAIN:** The area encompassing mine tailings and chat piles constitutes a facility as defined by the NCP.

*(A FACILITY is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or 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 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 300.410(e)])*



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

### B. REMOVAL CRITERIA (continued):

**DOES THE RELEASE INVOLVE A HAZARDOUS SUBSTANCE, POLLUTANT OR CONTAMINANT AS DEFINED BY THE NCP?**

YES ☒ or NO ☐

**EXPLAIN:** The release involves lead.

*(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 CWA, CERCLA, SDWA, CAA or 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 definition of 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 300.410(e)]*

**IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE?**

YES ☐ or NO ☒

**EXPLAIN:** No limitations on response apply.

*(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.).[40 CFR 300.410(e)]*

**DOES THE QUANTITY OR CONCENTRATION WARRANT RESPONSE?**

YES ☒ or NO ☐

**EXPLAIN:** Because lead was detected above health-based benchmarks in private drinking water supplies and in residential soils exceeding the time-critical removal action, further Superfund response is warranted.

*[40 CFR 300.410(e)]*



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

**HAS A PRP BEEN IDENTIFIED?** (Include name, address and telephone number)

YES ☒ or NO ☐

**EXPLAIN:** At this time, three PRPs have been identified: the Doe Run Company, Valle Mining Company, and Dresser, Inc. EPA Region 7 will assess site-related information to identify all other PRPs.

Doe Run:

Herculaneum Smelting Division

881 Main Street

Herculaneum, MO 63048

636-479-5311

Dresser, Inc.

15455 Dallas Parkway

Addison, TX 75001

Phone: 972.361.9800

Fax: 972.361.9903

Valles Mines

Property Owner: John Valle Harrison

401 Valles Mines School Rd.

or On-site Operation Headquarters

14116 Valles Mines School Road

Valles Mines, MO 63087

Information: (314) 586-3680, 771-8844

[40 CFR 300.410(e)]

**IS THERE AN ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS, OR CONTAMINANTS?**

YES ☒ or NO ☐

**EXPLAIN:** The potential for exposure to contaminated drinking water and soils exists at this site.

**IS THERE ACTUAL OR A POTENTIAL FOR CONTAMINATION OF DRINKING WATER SUPPLIES?**

YES ☒ or NO ☐

**EXPLAIN:** Elevated concentrations of lead have been detected in private drinking water wells.

**ARE THERE HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS, OR BULK STORAGE CONTAINERS?**

YES ☐ or NO ☒

**EXPLAIN:** No bulk storage containers of hazardous substances, pollutants, or contaminants have been identified at this site.

**ARE THERE HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS?**

YES ☒ or NO ☐

**EXPLAIN:** Field screening data and laboratory results have indicated lead concentrations in surface soils exceeding 400 ppm and 1,200 ppm action levels. However, due to the limited scope of this investigation, other properties not investigated may have been impacted.

*("High levels" may be determined by streamlined risk assessments, health consultations, state or federal soil screening criteria, and/or Superfund program policies or directives.)*

**ARE THERE CONDITIONS ON SITE WHICH MAY BE SUSCEPTIBLE TO IMPACT FROM ADVERSE WEATHER CONDITIONS?**

YES ☒ or NO ☐

**EXPLAIN:** Heavy rainfall could promote contaminated runoff and leaching to groundwater.



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

**IS THERE A THREAT OF FIRE OR EXPLOSION?**

YES ☐ or NO ☒

**EXPLAIN:** No threat of fire or explosion exists.

**IS THERE A POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS? YES ☐ or NO ☒**

**IF SO, IDENTIFY THE APPROPRIATE PROGRAM:**

\_\_\_RCRA \_\_\_NRC \_\_\_FIFRA \_\_\_UST \_\_\_OTHER FEDERAL (\_\_\_\_\_) \_\_\_STATE DEFERRAL

**EXPLAIN:**

**ARE THERE OTHER SITUATIONS OR FACTORS WHICH WARRANT FURTHER  
SUPERFUND RESPONSE?**

YES ☐ or NO ☒

**EXPLAIN:** No other factors have been identified that would warrant Superfund response.



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

### VI. SUPERFUND SITE SCREENING FINDINGS AND RECOMMENDATIONS:

**NO FURTHER SUPERFUND RESPONSE ACTION REQUIRED - SUPERFUND CERCLIS ENTRY NOT WARRANTED**

(Cite the appropriate criteria from SECTION V as the basis for the above determination.)

| Yes | No | Unknown | Issue   | Yes | No | Unknown | Issue  |
|-----|----|---------|---|-----|----|---------|--|
|     |    |         | Ground Water Pathway Threat                                       |     |    |         | Direct Exposure Pathway Threat                                 |
|     |    |         | Surface Water Pathway Threat                                      |     |    |         | Air Pathway Threat   |
|     |    |         | Release or Threat of Release                                      |     |    |         | A Facility or Vessel   |
|     |    |         | Hazardous Substance, Pollutant, or Contaminant                    |     |    |         | Subject To Response Limitations                                |
|     |    |         | Contaminants present in Significant Quantity and/or Concentration |     |    |         | Exposure To Hazardous Substances or Pollutants or Contaminants |
|     |    |         | Drums, Barrels or Bulk Containers Present                         |     |    |         | High Levels of Contaminants In Surface Soils                   |
|     |    |         | Site Susceptible To Adverse Weather Conditions                    |     |    |         | Threat of Fire or Explosion                                    |
|     |    |         | Willing/Capable PRP Response                                      |     |    |         | Referred To Another Program                                    |

**COMMENT:**

**REMOVAL ACTION RECOMMENDED:** ☐ EMERGENCY ☒ TIME-CRITICAL ☐ NON-TIME-CRITICAL

(Cite one or more of the conditions or factors from Section V. REMOVAL CRITERIA, as a basis for recommending that a removal action be conducted.)

| Yes | No | Unknown | Issue  | Yes | No | Unknown | Issue  |
|-----|----|---------|--|-----|----|---------|--|
| X   |    |         | Exposure To Hazardous Substances or Pollutants or Contaminants | X   |    |         | Actual or A Potential For Contamination of Drinking Water Supplies |
|     | X  |         | Drums, Barrels or Bulk Containers Present                      | X   |    |         | High Levels of Contaminants Near-Surface Soils                     |
| X   |    |         | Site Susceptible To Adverse Weather Conditions                 |     | X  |         | Fire/Explosion Threat  |
|     | X  |         | Other Response Mechanism                                       |     | X  |         | Other Factors  |

**COMMENT:** A removal action is warranted to address contaminated soils and drinking water at some residential properties. Further investigation is needed to assess the extent of the contamination before or concurrent with the removal action.

(Complete Recommended Removal Action Attachment and the Site Prioritization Information Summary Attachment for sites recommended for a Removal Action.)

### VI. SUPERFUND SITE SCREENING RECOMMENDATIONS (continued):

**ADDITIONAL INTEGRATED ASSESSMENT RECOMMENDED**

(Cite the appropriate criteria from Section V as a basis for recommending that additional site evaluation be performed.)



## REGION 7 SUPERFUND SITE PRE-CERCLIS SCREENING FORM

| Yes | No | Unknown | Issue   | Yes | No | Unknown | Issue  |
|-----|----|---------|---|-----|----|---------|--|
| X   |    |         | Ground Water Pathway Threat                                       | X   |    |         | Direct Exposure Pathway Threat                                 |
| X   |    |         | Surface Water Pathway Threat                                      |     | X  |         | Air Pathway Threat   |
| X   |    |         | Release or Threat of Release                                      | X   |    |         | A Facility or Vessel   |
| X   |    |         | Hazardous Substance, pollutant, or Contaminant                    |     | X  |         | Subject To Response Limitations                                |
| X   |    |         | Contaminants present in Significant Quantity and/or Concentration | X   |    |         | Exposure To Hazardous Substances or Pollutants or Contaminants |
|     | X  |         | Drums, Barrels or Bulk Containers Present                         | X   |    |         | High Levels of Contaminants In Surface Soils                   |
| X   |    |         | Site Susceptible To Adverse Weather Conditions                    |     | X  |         | Threat of Fire or Explosion                                    |
|     |    | X       | Willing/Capable PRP Response                                      |     | X  |         | Referred To Another Program                                    |

**COMMENT:** Due to the limited scope of the investigation, further assessment is warranted to fully evaluate the extent of contaminated soil and groundwater related to former mining activities in the area.

### VII. ADDITIONAL INFORMATION OR COMMENTS

(NOTE: Complete Site Prioritization Information Summary Attachment for sites recommended for further Integrated Assessment work.)

### EPA USE ONLY

### VIII. DETERMINATION

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 Name/Title/Office