



August 3, 2015

Mr. Bob Rosen  
Brownfields Project Manager  
U.S. Environmental Protection Agency, Region 4  
61 Forsyth Street, SW, 11<sup>th</sup> Floor  
Atlanta, Georgia 30303

**Subject: Final Phase II Environmental Site Assessment Report  
McClung Warehouses  
Knoxville, Knox County, Tennessee  
EPA Contract No. EP-S4-14-03  
Technical Direction Document No. TT-06-006**

Dear Mr. Rosen:

The Tetra Tech Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting the final Phase II environmental site assessment (ESA) report that summarizes Phase II ESA activities at the McClung Warehouses site in Knoxville, Knox County, Tennessee. The Phase II ESA report includes figures (Appendix A), tables (Appendix B), logbook notes and field sheets (Appendix C), a photographic log (Appendix D), the laboratory data packages (Appendix E), the Tetra Tech data validation report (Appendix F), and the table of witnesses (Appendix G).

If you have any questions or comments regarding this submittal, please call me at (678) 775-3115.

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Thomas'.

Satara Thomas  
Tetra Tech START IV Project Manager

A handwritten signature in black ink, appearing to read 'Andrew F. Johnson'.

Andrew F. Johnson  
Tetra Tech START IV Program Manager

Enclosures

cc: Katrina Jones, EPA Project Officer  
Angel Reed, Tetra Tech START IV Document Control Coordinator

**FINAL  
PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT**

**MCCLUNG WAREHOUSES  
KNOXVILLE, KNOX COUNTY, TENNESSEE**

**Prepared for**

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
Region 4  
Atlanta, Georgia 30303**



Contract No.	:	EP-S4-14-03
TDD No.	:	TT-06-006
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Andrew F. Johnson  
START IV Program Manager

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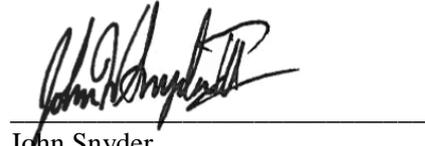
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## ENVIRONMENTAL PROFESSIONAL CERTIFICATION

I, John Snyder, declare that, to the best of my knowledge, I meet the definition of Environmental Professional as defined in *Code of Federal Regulations* Title 40, Section 312.10, in that I possess the requisite qualifications based on education, training, and experience to perform environmental assessment work on the site.



John Snyder  
Environmental Engineer, P.G.

## EXECUTIVE SUMMARY

This report presents the findings of a Phase II environmental site assessment (ESA) completed as part of the Targeted Brownfield Assessment (TBA) at the McClung Warehouses site. This Phase II ESA was conducted by the Tetra Tech (Tetra Tech) Superfund Technical Assessment and Response Team (START) on behalf of the U.S. Environmental Protection Agency (EPA) under Contract Number (No.) EP-S4-14-03, Technical Direction Document (TDD) No. TT-06-006.

The McClung Warehouses site is the former location of the McClung Warehouses; automobile garage; woodworking shop; freight shipping businesses; and railroad freight storage, shipment, and administrative operations. The site includes 10 parcels located at 401, 420, 501, 505, 509, 512, 517, 519, 523, and 525 W. Jackson Avenue in Knoxville, Knox County, Tennessee. The site covers between 4 and 5 acres of land in downtown Knoxville. Geographic coordinates of the approximate center of the site are latitude 35.9677 degrees north and longitude 83.9229 degrees west. The portion of the site located at 401, 501, 505, 509, 517, 519, 523, and 525 is bordered to the north-northwest by Norfolk Southern Railroad; to the east by a woodworking shop; to the south by W. Jackson Avenue followed by commercial businesses; and to the west is a mixed-use development. The portion of the site located at 420 and 512 W. Jackson Avenue is bordered to the north by W. Jackson Avenue followed by the portion of the site located at 401, 501, 505, and 509; to the east by a banquet hall; to the south by residential condos and a paved parking lot; and to the west by an architectural firm. The portion of the site known as the Option Tract that extends beneath the North Broadway and Oak Avenue overpasses is bordered to the north by Norfolk Southern Railroad and to the south by the Southeastern Glass building with underground parking garage and the Keener Lighting building.

Based on historical documents, the portion of the site located at 401 W. Jackson Avenue was previously occupied by railroad freight sheds and an administrative office building from approximately 1884 to 1997. In 1903, the C.M. McClung and Company operated on this portion of the site, but vacated property by 1917. A blacksmith shed also operated on this portion of the site for approximately 70 years. Freight businesses including Universal Southern Carthage Company and Cargo Re Manufactured Products, Inc. also operated on this portion of the site from the 1970s through the 1980s. By 2006, the property was a paved, self-service pay-to-park parking lot. The portion of the site located at 501 and 505 W. Jackson Avenue was previously occupied by drug and oil warehouses from approximately 1884 to 1890. By 1903, this portion of the site was vacant. In 1893, the McClung Warehouses were constructed on the

portion of the site located at 505 and 509 W. Jackson Avenue, which sold items such as lanterns, glassware, clocks, automobiles tires, lawn mowers, and bicycles. By 1917, the McClung Warehouses had expanded to the portion of the site located at 501, 517, and 523 W. Jackson Avenue. The portion of the site located at 525 W. Jackson Avenue was occupied by Crane Co. by 1950. In addition, an automobile garage occupied the portion of the site located at 512 W. Jackson Avenue by 1950. By 1973, the 512 W. Jackson Avenue property was a paved, free parking lot. The McClung Warehouses ceased operations in 1970; however, businesses still operated in the warehouses until 2014 (including a woodworking shop located in 509 W. Jackson Avenue). In 2007, a fire destroyed the warehouses located at 501, 505, and 509 W. Jackson Avenue. In 2014, a fire destroyed the warehouses located at 517, 519, 523, and 525 W. Jackson Avenue. The portion of the site known as the Option Tract, which extends beneath the North Broadway and Oak Avenue overpasses, appears to have been used as a rear access alleyway for the Keener Lighting and Southern Glass buildings.

In January 2015, Tetra Tech conducted a Phase I ESA to evaluate the site history and site conditions and to identify recognized environmental conditions (RECs) or potential RECs, if any, present on site. The front shells of the warehouses at 501, 505, 509, 517, 519, 523, and 525 W. Jackson Avenue remain because they are supporting W. Jackson Avenue. The portion of the site located at 401 W. Jackson Avenue is currently occupied by a self-service, pay-to-park parking lot. The portion of the site located at 420 and 512 W. Jackson Avenue is currently occupied by a fee parking lot. The Option Tract that runs beneath the N. Broadway and Oak Avenue overpasses is a paved alleyway for adjacent businesses.

A limited visual inspection of suspected asbestos-containing material (ACM) was conducted in the shells of the warehouses on site.

Based on the site visit and a review of the available historical and environmental records, the following RECs were identified as associated with the property:

- A railroad freight shed, tin shed, storage of railroad supplies, and a railroad administrative office operated on the portion of the site located at 401 W. Jackson Avenue for more than 100 years. The site was abandoned for railroad purposes between 1984 and 1988. Additionally, a blacksmith shed operated on this portion of the site for approximately 70 years. Freight businesses also operated on this portion of the site from the 1970s through the 1980s. Historical uses of the site likely left contamination along the railroad storage and blacksmith work areas and pose RECs.
- McClung Warehouses, Crane Co., and oil and drug warehouses operated on the portion of the site located at 401, 501, 505, 509, 517, 519, 523 and 525 W. Jackson Avenue. Historical uses of the

site likely left contamination along the railroad storage and work areas and pose RECs. The portions of the site located at 523 and 525 W. Jackson Avenue are depicted with Crane Co. and consisted of a sales office, loading dock, and a warehouse for mill supplies.

- An automobile garage operated on the portion of the site located at 512 W. Jackson Avenue for approximately 19 years. Historical use of the site for an automobile garage likely left contamination and poses a REC.
- Based on the proximity to the site, releases from facilities, no underground storage tank (UST) closure status or no further action (NFA) correspondences from the State of Tennessee, and potential past releases from historical operations, 44 of the facilities identified within the ASTM International-recommended search distances from the site present RECs to the site.
- Numerous suspected ACM were observed in the shells of the warehouses on the site and included brick, wall mortar, concrete foundation, and adhesive.

A review of federal and state database information was conducted, and a portion of the site located at 401 W. Jackson Ave was identified on the Facility Index System/Facility Registry System (FINDS) and the Resource Conservation and Recovery Act (RCRA) NonGen/ NLR databases reviewed. Seventy-four facilities were identified within the ASTM-recommended search distances from the subject property, and 44 of the facilities present RECs to the site. The remaining 30 facilities do not present RECs to the site.

During the week of March 23, 2015, Tetra Tech conducted the Phase II ESA field work, including collection of nine soil samples, three composites (including one duplicate), six soil gas (including one split), three groundwater samples (including one duplicate), and 53 suspected ACM samples.

All surface soil samples contained one or more metals at levels exceeding Regional Screening Levels (RSLs); these metals include aluminum, arsenic, cobalt, iron, manganese, thallium, and vanadium at concentrations that exceed the EPA RSL for residential or industrial soil. In addition, one surface sample collected at MC-SF-05 contained pesticide Aldrin at a concentration that exceeds the EPA RSL for residential and industrial. No volatile organic compounds (VOCs) or semivolatile organic compounds (SVOCs) were detected in the surface soil above the EPA RSLs for residential and industrial soils.

All subsurface soil samples contained one or more metals at levels exceeding RSLs; these metals include aluminum, arsenic, cobalt, iron, manganese, thallium, and vanadium at concentrations that exceed the EPA RSL for residential or industrial soil. No VOCs or SVOCs were detected in the subsurface soil above the EPA RSLs for residential and industrial soils.

Three composite soil samples collected in the Option Tract contained metals that exceed the EPA RSL for residential and industrial soil.

Two soil gas samples collected contained benzene at concentrations that exceeded the RSL for carcinogenic residential soil gas screening levels.

Groundwater samples contained metals, but not at concentrations that exceeded the maximum contaminant levels (MCL).

Six suspected ACM samples contained asbestos at greater than 1 percent.

Based on this Phase II ESA, RECs are present at the site. Tetra Tech recommends consideration of these results in planning future site uses. Additional ESA activity at the site, if any, is at the discretion of EPA, TDEC, and the property owners.

## 1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) directed the Tetra Tech Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) to conduct a Phase II environmental site assessment (ESA), including collection of samples, at the McClung Warehouses site, under Contract Number (No.) EP-S4-14-03, Technical Direction Document (TDD) No. TT-06-006. This Phase II ESA report describes the types, number, and locations of samples collected during the Phase II ESA sampling event, as well as the sampling methodologies followed and results of the laboratory analysis.

The purposes of this Phase II ESA were to (1) evaluate the recognized environmental conditions (REC) and other potential environmental hazards identified during the previous Phase I ESA at the site; (2) collect samples to assess the presence and nature of contamination, if any; and (3) generate the information necessary to prepare an Analysis of Brownfields Cleanup Alternatives (ABCA).

Phase II ESA activities at the site included the following:

- Conducting a geophysical survey around the proposed sampling locations at the site.
- Collecting surface and subsurface soil, soil gas, groundwater, and suspected asbestos-containing material (ACM) samples for laboratory analysis.
- Preparing written and photographic documentation of site features and sampling activities.
- Preparing sampling and chain-of-custody documentation.

Following this introduction, the organization of this Phase II ESA report is as follows:

- Section 2.0 conveys site background information, including the site location and description, previous investigations at the site, and the current status of the site.
- Section 3.0 describes the Phase II ESA activities, including sampling activities and methodologies, analytical support and methodologies, analytical data quality and data qualifiers, and deviations from the quality assurance project plan (QAPP).
- Section 4.0 presents Phase II ESA sampling analytical results.

- Section 5.0 provides a summary of findings for Phase II ESA sampling activities.
- Section 6.0 provides conclusions based on the findings for Phase II ESA sampling activities.
- Section 7.0 lists reference materials consulted.

Appendix A presents figures. Appendix B provides tables. Appendix C includes logbook notes and field sheets that document activities during the Phase II ESA field work. Appendix D contains a photographic log. Appendix E contains the laboratory data packages. Appendix F contains Tetra Tech's data validation report. Appendix G contains a table of witnesses.

All activities and procedures discussed and described in this Phase II ESA report were conducted in accordance with the approved Tetra Tech START Quality Management Plan (Reference [Ref.] 1). To ensure that all data quality objectives were met, Tetra Tech carried out these activities in accordance with prescribed guidance documents, including:

- EPA Region 4, Science and Ecosystem Support Division (SESD), Field Branches Quality System and Technical Procedures (FBQSTP) (Ref. 2)
- ASTM International (ASTM), *Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process*. Designation E 1903-11 (Ref. 3)
- EPA, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), Fourth Edition, Including Updates I through IVB, February 2007 (Ref. 4)
- EPA, Test Method for Determination of Asbestos in Bulk Building Materials, EPA 600/R-93/116, July 1993 (Ref. 5).

These guidance documents specifically apply to sampling locations, sample types, sampling procedures, use of data, data types, field quality assurance and quality control (QA/QC) samples, and sample analysis.

## 2.0 SITE BACKGROUND

This section discusses the site location and description, briefly summarizes the previous investigations conducted at the site, and discusses the current status of the site.

## 2.1 SITE LOCATION AND DESCRIPTION

The McClung Warehouses site is the former location of the McClung Warehouses; automobile garage; woodworking shop; freight shipping businesses; and railroad freight storage, shipment, and administrative operations; and includes 10 parcels located at 401, 420, 501, 505, 509, 512, 517, 519, 523, and 525 W. Jackson Avenue in Knoxville, Knox County, Tennessee. The site covers about 4 to 5 acres of land in downtown Knoxville. Geographic coordinates of the approximate center of the site are latitude 35.9677 degrees north and longitude 83.9229 degrees west. The portion of the site located at 401, 501, 505, 509, 517, 519, 523, and 525 is bordered to the north-northwest by Norfolk Southern Railroad; to the east by a woodworking shop; to the south by W. Jackson Avenue followed by commercial businesses; and to the west is a mixed-use development. The portion of the site located at 420 and 512 W. Jackson Avenue is bordered to the north by W. Jackson Avenue followed by the portion of the site located at 401, 501, 505, and 509; to the east by a banquet hall; to the south by residential condos and paved parking lot; and to the west by an architectural firm. The portion of the site known as the Option Tract that extends beneath the North Broadway and Oak Avenue overpasses is bordered to the north by Norfolk Southern Railroad and to the south by the Southeastern Glass Building with underground parking garage and the Keener Lighting Building.

Based on historical documents, the portion of the site located at 401 W. Jackson Avenue was previously occupied by railroad freight sheds and an administrative office building from approximately 1884 to 1997. In 1903, the C.M. McClung and Company operated on this portion of the site, but vacated property by 1917. A blacksmith shed also operated on this portion of the site for approximately 70 years. Freight businesses also operated on this portion of the site from the 1970s through the 1980s. By 2006, the property was a paved, self-service pay-to-park parking lot. The portion of the site located at 501 and 505 W. Jackson Avenue were previously occupied by drug and oil warehouses from approximately 1884 to 1890. By 1903, the site was vacant. In 1893, the McClung Warehouses were constructed on the portion of the site located at 505 and 509 W. Jackson Avenue, which sold items such as lanterns, glassware, clocks, automobiles tires, lawn mowers, and bicycles. By 1917, the McClung Warehouses had expanded to the portion of the site located at 501, 517, and 523 W. Jackson Avenue. The portion of the site located at 525 W. Jackson Avenue was occupied by Crane Co. by 1950. In addition, an automobile garage occupied the portion of the site located at 512 W. Jackson Avenue by 1950. By 1973, the property was a paved, free parking lot. The McClung Warehouses ceased operations in 1970; however, businesses still operated in the warehouses, including a woodworking shop located in 509 W. Jackson Avenue. A fire in

2007 destroyed warehouses located at 501, 505, and 509 W. Jackson Avenue. In 2014, a fire destroyed the warehouses located at 517, 519, 523, and 525 W. Jackson Avenue.

At present, all warehouses have been torn down except for the front shells of each of the warehouses because they support W. Jackson Avenue. The concrete foundations still remain at the site. The Option Tract immediately north of the site located at 501, 505, 509, 517, 519, 523, and 525 is grass and dirt covered. The remainder of the site is covered by asphalt and used as parking lots. The portion of the site located at 501, 505, 509, 517, 519, 523, and 525 is fenced, but is easily accessible on the north-northwest side of the site (see Figure 2 in Appendix A).

## 2.2 PREVIOUS INVESTIGATIONS

In February 2009, Soil and Materials Engineer (S&ME) conducted a Phase I ESA. Several potential RECs were identified. Based on historical Sanborn Maps, this portion of the site was developed from 1884 and 1890 with railroad open freight sheds and an administrative office building for Southern Railroad. In 1903, C. M. McClung and Co. operated a warehouse at the site. The railroad open freight sheds were still present during that time. From 1917 to 1997, the site was still developed with freight sheds, an administrative office building, and a temporary storage building for Southern Railroad. S&ME recommended additional investigation to assess the potential for contamination from off-site sources and past uses of the site.

Also in February 2009, S&ME conducted a soil sampling and passive soil vapor survey at the portion of the site located at 401 W. Jackson Avenue. S&ME collected one soil and seven soil gas samples at the site. Arsenic (31 milligrams per kilogram [mg/kg]) and lead (880 mg/kg) were detected in the soil sample at a concentration that exceeded the 2008 EPA Regional Screening Levels (RSLs) of 0.39 mg/kg and 800 mg/kg for industrial soil. Four other contaminants, including mercury, barium, cadmium, and chromium, were also detected, but did not exceed the EPA RSLs. Six of the seven soil gas samples contained detectable concentrations of petroleum-related compounds such as total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene and xylene (BTEX); undecane, tridecane, and pentadecane (diesel-range hydrocarbons); and naphthalene and 2-methylnaphthalene. However, the passive soil vapor survey could not quantify the volume of contaminated media or identify the source of the contamination. Based on the results of the samples collected (soil and soil gas), S&ME recommended confirmation sampling and analysis before construction would begin.

In March 2009, S&ME conducted a Phase II ESA. Twenty-four subsurface soil samples were collected at the 401 W. Jackson Avenue property. The samples were analyzed for Resource Conservation and Recovery Act (RCRA) metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). Arsenic was the only contaminant detected above the EPA RSL for residential soil. Thirteen soil samples contained arsenic at levels exceeding the EPA RSL of 0.67 mg/kg; six of these samples exceeded the naturally occurring average background level of 10 mg/kg for arsenic in soil in Tennessee.

In January 2015, Tetra Tech conducted a Phase I ESA on behalf of EPA to evaluate the site history and site conditions and to identify RECs or potential RECs, if any, present on site. The front shells of the warehouses at 501, 505, 509, 517, 519, 523, and 525 W. Jackson Avenue remain because they are supporting W. Jackson Avenue. The portion of the site located at 401 W. Jackson Avenue is currently occupied by a self-service, pay-to-park parking lot. The portion of the site located at 420 and 512 W. Jackson Avenue is currently occupied by a fee parking lot. The Option Tract that runs beneath the N. Broadway and Oak Avenue overpasses is a paved alleyway for adjacent businesses.

A limited visual inspection of suspected ACM was conducted in the shells of the warehouses on site and included brick, wall mortar, concrete foundation, and adhesive.

Based on the site visit and a review of the available historical and environmental records, the following RECs were identified as associated with the property:

- A railroad freight shed, tin shed, storage of railroad supplies, and a railroad administrative office operated on the portion of the site located at 401 W. Jackson Avenue for more than 100 years. The site was abandoned for railroad purposes between 1984 and 1988. Additionally, a blacksmith shed operated on this portion of the site for approximately 70 years. Freight businesses also operated on this portion of the site from the 1970s through the 1980s. Historical use of the site likely left contamination along the railroad storage and blacksmith work areas and poses a REC.
- McClung Warehouses, Crane Co., and oil and drug warehouses operated on the portion of the site located at 401, 501, 505, 509, 517, 519, 523 and 525 W. Jackson Avenue. Historical use of the site likely left contamination along the railroad storage and work area and poses a REC. The portion of the site located at 523 and 525 W. Jackson Avenue are depicted with Crane Co. and consisted of a sales office, loading dock, and a warehouse for mill supplies.
- An automobile garage operated on the portion of the site located at 512 W. Jackson Avenue for approximately 19 years. Historical use of the site for an automobile garage likely left contamination and poses a REC.
- Numerous suspected ACM were observed in the shells of the warehouses on the site and included

brick, wall mortar, concrete foundation, and adhesive.

A review of federal and state database information was conducted, and a portion of the site located at 401 W. Jackson Ave was identified on the Facility Index System/Facility Registry System (FINDS) and the Resource Conservation and Recovery Act (RCRA) NonGen/ NLR databases reviewed. Seventy-four facilities were identified within the ASTM-recommended search distances from the subject property, and 44 of the facilities present RECs to the site based on proximity to the site, presumed groundwater flow to the northwest, confirmed releases with No Further Action (NFA) status, and potential releases from historical operations (Ref. 8).

### **2.3 CURRENT STATUS**

Access to the site is unrestricted. The portion of the site located at 401 W. Jackson Avenue is currently occupied by a self-service, pay-to-park parking lot, two charging stations, and a former telecommunications tower. The portion of the site located at 420 and 512 W. Jackson Avenue is currently a paved, free parking lot.

According to the City of Knoxville Tax Assessor's website, the owner for the portion of the site located at 401 W. Jackson Avenue is the City of Knoxville; owner for the portion of the site located at 420, 501, 505, 512, 517, 519, 523, and 525 is the Knoxville's Community Development Corporation; and owner for the portion of the site located at 509 W. Jackson Avenue is Ernie and Pamela H. Gross.

### **3.0 PHASE II ACTIVITIES**

The purposes of the Phase II ESA sampling event were to evaluate the RECs and other potential environmental hazards identified during the 2015 Phase I ESA; collect samples to assess the presence and nature of contamination, if any; and generate the information necessary to prepare an ABCA. Tetra Tech conducted Phase II ESA field work at the McClung Warehouses site during the week of March 23, 2015, executing the scope of work outlined in the revised final QAPP for the McClung Warehouses site that Tetra Tech prepared for EPA (Ref. 7). The sampling approach was based on observations made during the January 2015 Phase I ESA site visit and a review of historical documentation and regulatory databases (Ref. 8). Figures 4 and 5 in Appendix A depict sampling locations; Tables 2 through 7 in Appendix B summarize analytical results; logbook notes and field sheets are in Appendix C; and a photographic log is in Appendix D.

### 3.1 SAMPLING ACTIVITIES AND METHODOLOGIES

Tetra Tech collected 16 soil samples, three 5-point composites (including one duplicate), seven soil gas samples (including one split), three groundwater samples (including one duplicate), and 53 samples of suspected ACM. All sampling was conducted in accordance with applicable EPA Region 4 SESD FBQSTP, unless otherwise specifically noted (Ref. 2).

#### 3.1.1 Soil Sampling

Tetra Tech collected eight surface (2 feet below paved surface [bps]) and eight subsurface (2.5 to 10 feet bps) soil samples from the site to assess the presence or absence of contamination. The soil borings were advanced using direct-push technology (DPT) to about 10 feet bps. Soil borings were screened in the field with a flame ionization detector (FID) to assess the presence or absence of VOC vapors. The FID did not detect elevated VOC vapors in the soil borings; therefore, subsurface samples were collected at 9 to 10 feet bps (the deepest interval).

Three 5-point composite samples were collected using pre-cleaned stainless steel auger buckets to about 4 inches below ground surface (bgs). The VOC fraction for sample MC-COM-01 was collected from the center aliquot, and the VOC fraction for sample MC-COM-02 was collected from a non-center aliquot that appeared contaminated.

All soil samples were collected in accordance with the EPA Region 4 SESD FBQSTP *Soil Sampling* SESDPROC-300-R2, December 2011 (Ref. 2) and were analyzed for target compound list (TCL) VOCs, TCL SVOCs, pesticides, herbicides, polychlorinated biphenyls (PCBs), and target analyte list (TAL) metals, except for MC07 and MC08, which were not analyzed for pesticides. Surface and subsurface soils samples (MC-SF-05 and MC-SB05-20) were collected at 517 W. Jackson Avenue based on a strong creosote odor, but no groundwater sample was collected because of insufficient groundwater.

#### 3.1.2 Monitoring Well Installation

During the Phase II ESA, Tetra Tech procured M&W Drilling, LLC (M&W), to install three temporary monitoring wells. The wells were installed using DPT and were constructed and abandoned in accordance with the EPA Region 4 SESD FBQSTP *Design and Installation of Monitoring Wells*

SESDGUID-101-R1, January 2013. The depths of the wells were 15 feet bps (see Appendix C, pp. 12-15). No monitoring well was installed at sampling location MC08 because the drill met refusal. The drillers offset twice to try to install a temporary monitoring well, but groundwater was insufficient to collect a sample.

### 3.1.3 Groundwater Sampling

Before groundwater was sampled, Tetra Tech sufficiently purged the temporary groundwater wells in accordance with SESDPROC-301-R3, March 2013. Three groundwater samples (including one duplicate) were collected from two temporary monitoring wells installed during the Phase II ESA. One temporary monitoring well (MC-GW-01) was installed northeast of the parking lot at 401 W. Jackson Avenue. A second temporary monitoring well (MC-GW-05) was installed on the north side of the concrete foundation at 501 W. Jackson Avenue. An attempt was made to install temporary monitoring well MC-GW-05 at 517 W. Jackson Avenue, but drill refusal was encountered at 27 feet bps. Tetra Tech relocated sample MC-GW-05 to 501 W. Jackson Avenue. The third temporary monitoring well (MC-GW-08) was not installed because the drill met refusal and groundwater was insufficient (see Figure 3 Appendix A). Figure 3 in Appendix A depicts the groundwater sampling locations. The groundwater samples were collected in accordance with the EPA Region 4 SESD FBQSTP *Groundwater Sampling* SESDPROC-301-R3, March 2013; and were analyzed for TCL VOCs, TCL SVOCs, TCL PCBs, TCL pesticides, TCL herbicides, and TAL metals (Ref. 2).

### 3.1.4 Soil Gas Sampling

Tetra Tech collected seven soil gas samples (including a split) from the site to evaluate the presence or absence of contamination between 2 to 10 feet bps. Before sampling began, each Summa canister with a flow controller attached was calibrated by the Tetra Tech-procured laboratory to collect an integrated air sample over a 1-hour period. Tetra Tech then performed a leak test on each of the Summa canisters. Each boring location was purged three well volumes. The soil gas samples were collected in accordance with the EPA Region 4 SESD *FBQSTP for Soil Gas Sampling*, SESDPROC-307-R3, May 2014, and Tennessee Department of Environmental Conservation (TDEC) Division of Underground Storage Tanks Technical Guidance Document-018, *Requirements for Conducting Soil Gas Surveys*, April 1, 2007 (Refs. 2; 13).

### **3.1.5 Suspected ACM Sampling**

Suspected ACM samples were collected from the front shells of the warehouses by a Tetra Tech Tennessee-licensed asbestos inspector, Paul Prys, Asbestos Hazard Emergency Response Act (AHERA) Accredited Asbestos Inspector, certificate number A-1-50043-34058. A total of 53 ACM samples were collected from 15 homogeneous areas (HA). A minimum of three samples were collected from each homogeneous area of suspected ACM Mr. Prys observed at the time of the inspection.

Suspected ACM sampling was conducted in accordance EPA Region 4 SESD FBQSTP *Bulk Sampling for Asbestos*, SESDGUID-104-R1 (June 2013). Figures 4A through 4D in Appendix A depict the suspected ACM sampling locations. Table 2 in Appendix B lists the number of suspected ACM samples, the material descriptions, the warehouse shell and address, and the location where the samples were collected.

### **3.1.6 Investigation-Derived Waste Sampling**

Groundwater purged prior to sampling was containerized in one 55-gallon drum and sampled. A groundwater sample (MC-IDW-WATER) was collected to identify the appropriate disposal method for the purge water. Investigation-derived waste (IDW) samples were subjected to Toxicity Characteristic Leaching Procedure (TCLP) analysis for VOCs, SVOCs, pesticides, herbicides, and metals. Soil cuttings generated from soil borings and well installations were returned to the boring; therefore, no soil IDW sample was collected.

## **3.2 ANALYTICAL SUPPORT AND METHODOLOGIES**

Tetra Tech procured TestAmerica of Savannah, Georgia, to analyze the soil, soil gas, groundwater, and asbestos samples. The soil and groundwater samples were submitted for analysis in accordance with the following EPA SW-846 methods: TCL VOCs by Method 8260B, SVOCs by Method 8270D, pesticides/herbicides by Method 8151A and 8081B, and PCBs by Method 8082A; and TAL metals using EPA SW-846 Methods 6010C, 6020A, and 7471B/7470A. The soil gas samples were submitted for analysis using EPA Compendium Method TO-15. The IDW samples were prepared by TCLP using EPA Method 1311 for analysis. TestAmerica subcontracted EMLab P&K North Phoenix (EMLab) to analyze

the suspected ACM samples for asbestos by polarized light microscopy (PLM) using EPA Test Method 600/R-93/116, July 1993 (Refs. 4; 5; 6).

Level IV data packages were requested from TestAmerica for the soil, soil gas, and groundwater samples. The data packages were to include case narratives, chain-of-custody forms, sample results, QC summary forms, and the raw data. EMLab provided asbestos results in its standard report format. A 14-day turnaround time was requested for analytical results from all samples submitted to the laboratory for analysis. The analytical data packages, as received from the laboratories, are provided in Appendix E.

After the data packages for the soil, soil gas, and groundwater samples had been received from the laboratory, Tetra Tech reviewed them for completeness and conducted a Stage 2A ( cursory) data validation. The data validation process included a random QA/QC comparison between the data listed in the electronic data deliverables and the electronic portable document format copy of the analytical data packages. Analytical results from the soil, soil gas, and groundwater samples were validated in accordance with the associated EPA SW-846 Methods; the EPA NFGs for Superfund Organic Data Review 540-R-08-01, June 2008; and the EPA NFGs for Superfund Inorganic Methods Data Review, EPA 540-R-10-011, January 2010; Section 4.2.2, page 51 of the Tetra Tech START Program Level QAPP, May 2012 (Refs. 4; 5; 6). The Tetra Tech data validation report is provided in Appendix F. Asbestos results were reviewed for completeness, but were not validated.

### **3.3 ANALYTICAL DATA QUALITY AND DATA QUALIFIERS**

The text and analytical data tables presented in this report provide some of the results of organic and inorganic parameters as qualified with a “J,” “J+,” “J-,” “U,” or “UJ.” The “J” notation indicates that the analyte was positively identified; however, the reported value is an estimate. The “J” notation may also include a “+” indicating a high bias. The “J” notation may also include a “-” indicating a low bias. The “U” notation indicates that the analyte was not detected at or above the associated value (reporting limit [RL]). The “UJ” notation indicates that the analyte was not detected at or above the associated value (RL), which is considered approximate based on deficiencies in one or more QC criteria. The complete set of analytical data as received from the laboratory is provided in Appendix E, and the Tetra Tech data validation report is provided in Appendix F.

### 3.4 DEVIATIONS FROM THE QUALITY ASSURANCE PROJECT PLAN

The following deviations from the QAPP occurred during Phase II ESA sampling:

- A matrix spike and matrix spike duplicate (MS/MSD) sample was not performed for pesticides/PCBs on sample MC-GW-01 because volume was insufficient.
- Surface samples were collected at 1 to 2 feet bps. The 0- to 1-foot interval consisted of pavement and backfill material.
- Subsurface samples were collected from 2.5 to 10 feet bps.
- Soil, soil gas, and groundwater samples at the 501, 505, 509, 517, 519, 523, and 525 addresses were collected through the concrete foundations of the warehouse.
- The groundwater at sampling location MC-GW-08 was not sufficient to sample; therefore, only two boring locations could be sampled for groundwater.
- All soil gas samples were collected with Summa canisters and analyzed for VOCs, naphthalene, and 2-methylnaphthalene. No soil gas samples were collected with a sorbent cartridge or tube.
- Soil cuttings from soil borings and wells installations were placed back in the boring; therefore, no soil IDW sample was collected.
- The soils were screened with a FID.
- The laboratory analyzed sampling location MC07 and MC08 for herbicides.
- Analytical results were compared with EPA RSLs Hazard Quotient (HQ) 0.1, June 2015.

### 4.0 PHASE II SAMPLING ANALYTICAL RESULTS

The following sections summarize analytical results of samples collected during the Phase II ESA conducted during the week of March 23, 2015. These sections will focus on results that exceed certain guidance values for the particular medium and contaminant.

Analytical results for soil samples were compared with EPA RSLs for residential and industrial soil (Ref. 9). Analytical results for groundwater were compared with EPA Maximum Contaminant Levels (MCLs) for drinking water (Ref. 10). Results for soil gas were compared with the EPA RSLs for residential and industrial air (Ref. 9). See section 4.5 Soil Gas Sampling Results for additional details. Analytical results of suspected ACM samples were compared with standards at 40 Code of Federal Regulations (CFR) Part 763-Asbestos (Ref. 11). Figures 3, 4A through 4D in Appendix A depict the soil, groundwater, and

suspected ACM sampling locations; a summary of analytical data is presented in Tables 2 through 7 of Appendix B.

#### **4.1 SURFACE SOIL SAMPLING RESULTS**

Arsenic was detected in all surface soil samples at concentrations above the EPA RSLs of 0.67 mg/kg for residential and 3.0 mg/kg for industrial soil. Arsenic concentrations ranged from 10 mg/kg (MC-SF06-01) to 34 mg/kg (MC-SF05-01). Thallium was detected in all surface soil samples above the EPA RSL of 0.078 mg/kg for residential soil. Thallium concentrations ranged from 0.13 mg/kg (MC-SF-04) to 0.35 mg/kg (MC-SF-07-01). Manganese was detected in seven surface soil samples at concentrations that exceeded the EPA RSL of 180 mg/kg for residential soil. Manganese concentrations ranged from 120 mg/kg (MC-SF07-01) to 1,900 mg/kg (MC-SF-02). Sample MC-SF-05 (2,700 mg/kg) exceeded the EPA RSL of 2,600 mg/kg for industrial soil. Several additional metals (aluminum, cobalt, iron, and vanadium) were detected at concentrations above their respective EPA RSL for residential or industrial soil. Surface soil sample MC-SF-05 contained Aldrin at 40 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ), exceeding the EPA RSL of 31  $\mu\text{g}/\text{kg}$  for residential soil. VOCs and SVOCs were also detected above their laboratory reporting limits in surface soil; however, their concentrations do not exceed EPA RSLs for residential and industrial soil. No PCBs or herbicides were detected in the surface soil samples. Table 2 in Appendix B summarizes the analytical results for surface soil samples.

#### **4.2 SUBSURFACE SOIL SAMPLING RESULTS**

Arsenic was detected in all subsurface soil samples at concentrations above the EPA RSLs of 0.67 mg/kg for residential and 3.0 mg/kg for industrial soil. Arsenic concentrations ranged from 12 mg/kg (MC-SB02-09) to 150 mg/kg (MC-SF05-01). Thallium was detected in all surface soil samples above the EPA RSL of 0.078 mg/kg for residential soil. Thallium concentrations ranged from 0.14 mg/kg (MC-SB02-09) to 0.41 mg/kg (MC-SB05-20 and MC-SB05-09). Manganese was detected in all subsurface soil samples at concentrations that exceeded the EPA RSL of 180 mg/kg for residential soil. Manganese concentrations ranged from 570 mg/kg (MC-SB05-09) to 3,000 mg/kg (MC-SB05-20). Sample MC-SB05-20 (3,000 mg/kg) exceeded the EPA RSL of 2,600 mg/kg for industrial soil. Several additional metals (aluminum, cobalt, iron, and vanadium) were detected at concentrations above their EPA RSL for residential or industrial soil. No VOCs, SVOCs, PCBs, pesticides or herbicides were detected in the

subsurface soil samples. Table 3 in Appendix B summarizes the analytical results for subsurface soil samples.

#### **4.3 COMPOSITE SOIL SAMPLING RESULTS**

Arsenic was detected in all composite soil samples above the EPA RSLs of 0.67 mg/kg for residential and 3.0 mg/kg for industrial soil. Arsenic concentrations ranged from 27 mg/kg (MC-COM-01 and MC-COM-01-DUP) to 45 mg/kg (MC-COM-02). Thallium was detected in all composite soil samples above the EPA RSL of 0.078 mg/kg for residential soil. Thallium concentrations ranged from 0.14 mg/kg (MC-COM-01) to 0.39 mg/kg (MC-COM-02). Manganese was detected in all subsurface soil samples at concentrations that exceeded the EPA RSL of 180 mg/kg for residential soil. Manganese concentrations ranged from 500 mg/kg (MC-COM-02) to 980 mg/kg (MC-COM-01-DUP). Lead was detected up to 420 mg/kg in sample MC-COM-01-DUP, which exceeds the EPA RSL of 400 mg/kg for residential soil. Several additional metals (aluminum, cobalt, and iron) were detected at concentrations above their EPA RSL for residential soil. SVOCs were also detected above their laboratory reporting limits in surface soil; however, their concentrations do not exceed EPA RSLs for residential and industrial soil. No VOCs, PCBs, pesticides, or herbicides were detected in the composite soil samples. Table 4 in Appendix B summarizes the analytical results for composite soil samples.

#### **4.4 GROUNDWATER SAMPLING RESULTS**

Three groundwater samples (including one duplicate) were collected from two temporary monitoring wells installed during the Phase II ESA. Aluminum, barium, calcium, cobalt, iron, magnesium, manganese, nickel, potassium, sodium, and zinc were detected in groundwater above their laboratory limits; however, their concentrations do not exceed EPA MCLs. No VOCs, SVOCs, PCBs, pesticides, or herbicides were detected in the groundwater samples. Table 5 in Appendix B summarizes the analytical results for groundwater samples.

#### **4.5 SOIL GAS SAMPLING RESULTS**

Six soil gas samples were collected at the site. The soil gas samples were collected beneath the paved parking lots and concrete foundations of the warehouse shells. Soil gas analytical results were compared to a calculated vapor intrusion screening level (VISL) that were developed in accordance with the EPA

*Office of Solid Waste and Emergency Response (OSWER) Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, June 2015* (See Appendix A of Ref. 14), more specifically the VISLs were calculated using the sub-slab soil gas attenuation factor of 0.03 from Table 6-1 of Reference 14 and the June 2015 RSL Resident and Industrial Ambient Air Tables, Hazard Quotient 0.1. For example, benzene was detected in two soil gas samples above the calculated VISL Cancer Screening Level of 12 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for residential air. The calculated VISL Cancer Screening Level value was obtained by using the benzene Resident Ambient Air cancer value of  $0.36 \mu\text{g}/\text{m}^3$  divided by the 0.03 attenuation factor to equal  $12 \mu\text{g}/\text{m}^3$ . Benzene concentrations ranged from  $18 \mu\text{g}/\text{m}^3$  (MC-SG-01) to  $30 \mu\text{g}/\text{m}^3$  (MC-SG-04). Table 6 in Appendix B summarizes the analytical results for soil gas samples.

#### **4.6 SUSPECTED ACM SAMPLING RESULTS**

Suspected ACM samples with an asbestos content of greater than 1 percent were considered positive for asbestos in accordance with the EPA definition of ACM found in 40 CFR Part 763.83. Of the 53 samples collected, six samples contained asbestos at greater than 1 percent. These samples were collected from roofing flashing and miscellaneous wall adhesive and analyzed in multiple layers. Sample MC-RF1-02 consisted of black roofing mastic and black roofing tar and felt. The black roofing mastic was found to contain asbestos at 7 percent, and the black roofing tar and felt was found to contain asbestos at 10 percent. Two additional black roofing tar and felt samples contain asbestos at 10 percent. The black mastic was found to contain asbestos at 10 percent in samples MC-MWA-01, MC-MWA-02, and MC-MWA-03. Table 7 in Appendix B summarizes the analytical results for the suspected ACM samples.

#### **4.7 INVESTIGATION-DERIVED WASTE SAMPLING RESULTS**

IDW sample MC-IDW-WATER were subjected to TCLP analysis for VOCs, SVOCs, herbicides and pesticides, and metals. No contaminant listed on the TCLP parameters list was detected above the 40 CFR 261.24 regulatory limits in the IDW samples (see Table 8 in Appendix B).

### **5.0 SUMMARY OF FINDINGS**

During the week of March 23, 2015, Tetra Tech, on behalf of EPA, conducted a Phase II ESA at the

McClung Warehouses site to evaluate the RECs and other potential environmental hazards identified during the 2015 Phase I ESA at the site; collect samples to assess the presence and nature of contamination, if any; and generate the information necessary to prepare an ABCA. The assessment included sampling of surface and subsurface soil, groundwater, soil gas, and suspected ACM. The results of the Phase II ESA investigation suggest RECs currently exist at the site that warrant consideration in planning future uses of the property. The following issues should be considered:

- All nine surface soil samples collected throughout the site contained arsenic at a concentration that exceeds the EPA RSL for industrial soil. Cobalt (MC-SF-02) and manganese (MC-SF-05) were detected at concentrations that exceed the EPA RSL for industrial soil. Several additional metals (aluminum, cobalt, iron, manganese, thallium, and vanadium) were detected at concentrations above their EPA RSL for residential soil.
- All nine subsurface soil samples collected throughout the site contained arsenic at a concentration that exceeds the EPA RSL for industrial soil. Cobalt (MC-SB01-05) and manganese (MC-SB05-20) were detected at concentrations that exceed the EPA RSL for industrial soil. Several additional metals (aluminum, cobalt, iron, lead, manganese, thallium, and vanadium) were detected at concentrations above their EPA RSL for residential soil.
- Three composite soil samples collected in the Option Tract contained arsenic at concentrations that exceed the EPA RSL for industrial soil. Several additional metals (aluminum, cobalt, iron, lead, manganese, and thallium) were detected at concentrations above their EPA RSL for residential soil.
- No groundwater samples contained analytes at concentrations exceeding their EPA MCL.
- Two soil gas samples contained benzene at concentrations exceeding their EPA RSL Cancer Target Risk for residential air.
- Six suspected ACM samples from two HA contained asbestos at greater than 1 percent.
- No contaminant listed on the TCLP parameters list was detected above the regulatory limits in 40 CFR 261.24 in the IDW samples.

## 6.0 CONCLUSIONS

Contamination identified in this Phase II ESA report is consistent with the RECs identified in the Phase I ESA report. The metals and petroleum contamination in the soil and soil gas is consistent with the use of the site as a railroad freight shipping and storage, blacksmith shop, and woodworking shop, from 1884 to 2007.

Of the 53 ACM samples collected, six samples contained asbestos at greater than 1 percent. These samples were collected from wall adhesive (HA4) and roof flashing (HA9) found at 505 and 523W. Jackson Avenue.

Suspected ACM found to contain asbestos at less than 1 percent are not regulated by the National Emissions Standards for Hazardous Air Pollutants (NESHAP). Nevertheless, the Occupational Safety and Health Administration (OSHA) has interpreted that even minor concentrations of asbestos constitute a concern to workers during the demolition process and therefore require special handling during cleanup and disposal practices beyond those imposed by NESHAP.

To the best of our knowledge and belief, all suspected ACM accessible during observations were sampled and documented. However, without significant destructive sampling, some materials may not have been observed or sampled by the inspector. If any materials encountered during abatement are different from the materials sampled, they should be assumed to contain asbestos until sampling can be performed to document them as non-asbestos containing.

Based on this Phase II ESA, RECs are present at the site. Tetra Tech recommends consideration of these results in planning future site uses. Additional ESA activity at the site, if any, is at the discretion of EPA, TDEC, and the property owners.

## 7.0 REFERENCES

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2. U.S. Environmental Protection Agency (EPA). Region 4 Science and Ecosystem Support Division (SESD) Field Branches Quality System and Technical Procedures: *Soil Sampling* (SESDPROC-300-R2), December 2011; *Groundwater Sampling* (SESDPROC-301-R3), March 2013; *Bulk Sampling for Asbestos* (SESDGUID-104-R1), June 2013; and *Soil Gas Sampling* (SESDPROC-307-R3), May 2014. Accessed on-line at: <http://www.epa.gov/region4/sesd/fbqstp/index.html>
3. ASTM International (ASTM). *Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process*. Designation: E 1903-11.
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14. EPA. *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*. June 2015.

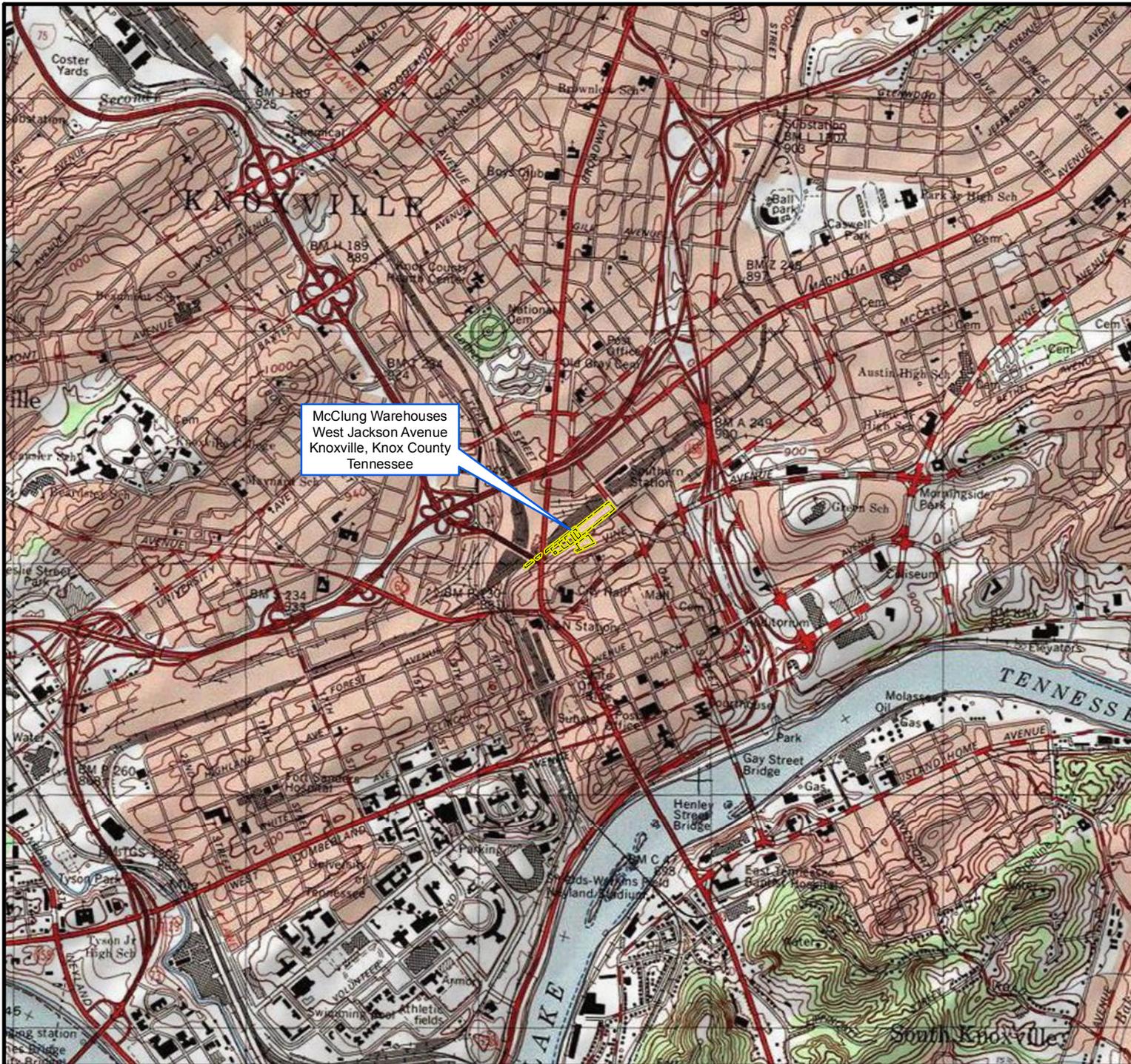
## APPENDIX A

### FIGURES

(Seven Pages)

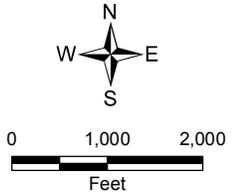
#### FIGURE

- 1 SITE LOCATION
- 2 SITE LAYOUT
- 3 SOIL, SOIL GAS, AND GROUNDWATER SAMPLING LOCATIONS
- 4 ASBESTOS SAMPLING LOCATIONS

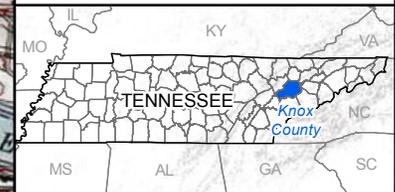


McClung Warehouses  
West Jackson Avenue  
Knoxville, Knox County  
Tennessee

**Legend**  
 Site Location



Map Source:  
USGS 7.5 Minute Topographic Quadrangle Map:  
Knoxville, TN 1978.

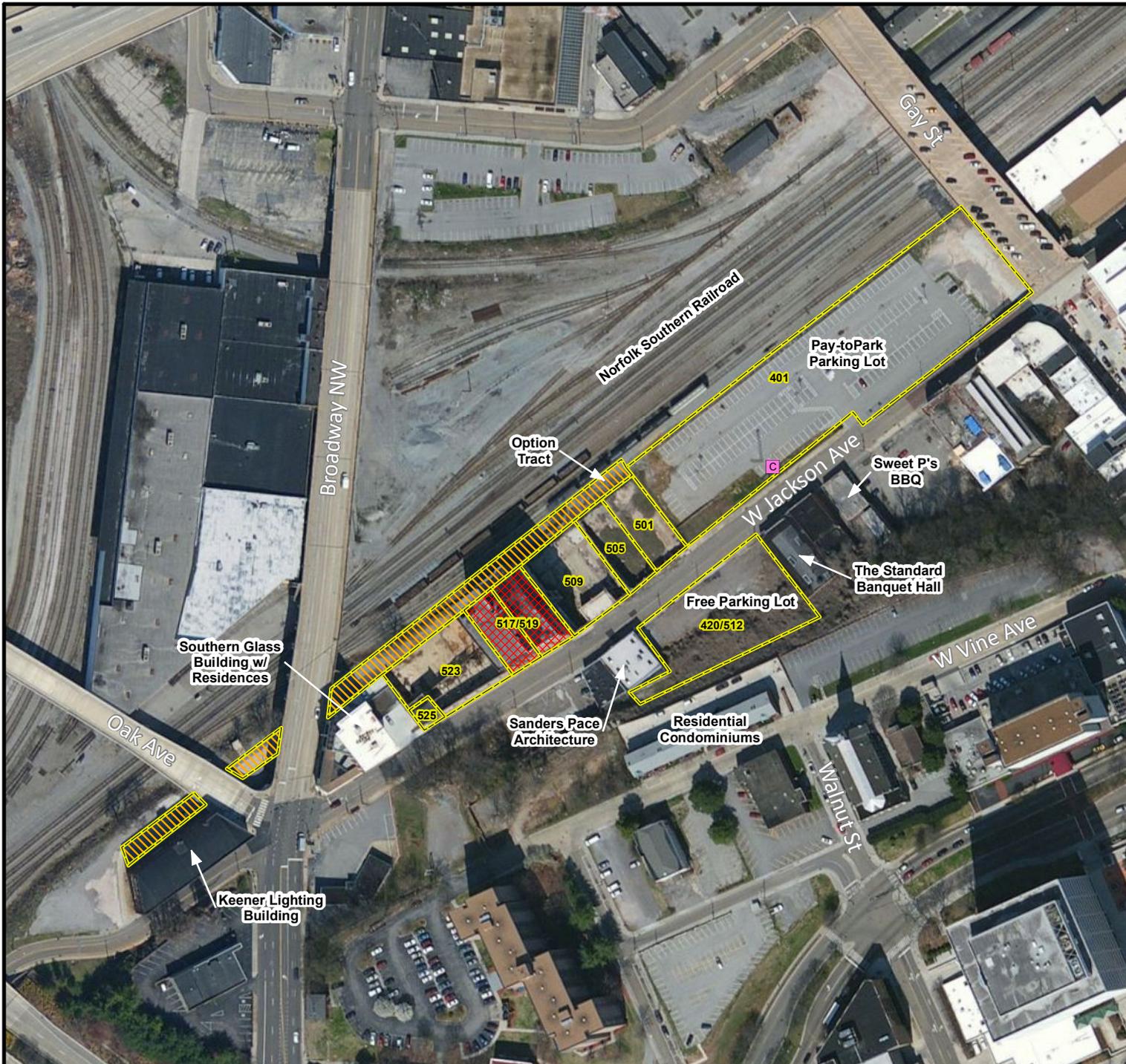


 **United States  
Environmental Protection Agency  
Region 4**

**FIGURE 1**  
Site Location

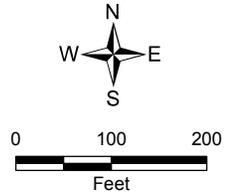
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**TDD No.:** TT-06-006  
**City:** Knoxville    **County:** Knox    **State:** Tennessee

 **TETRA TECH**    **Date:** 2/25/2015  
**Analyst:** dale.vonbusch

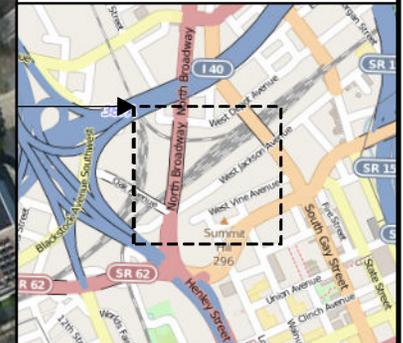


**Legend**

-  Site Location
-  Option Tract
-  Former Buildings (no longer present)
-  Car Charging Stations



Map Source:  
Parcel Boundaries, City of Knoxville.  
Aerial Imagery, Bing 2012-2013.



 **United States Environmental Protection Agency Region 4**

**FIGURE 2**  
Site Layout

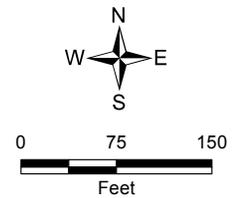
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**TDD No.:** TT-06-006  
**City:** Knoxville    **County:** Knox    **State:** Tennessee

 **TETRA TECH**    **Date:** 4/6/2015  
**Analyst:** dale.vonbusch



**Legend**

- Soil Boring Sample
- ◆ 5-point Soil Composite Sample
- ▲ Soil Gas Sample
- Soil Boring and Groundwater Samples
- ◇ Stain
- Site Location



Notes:  
 COM - Composite sample  
 GW - Groundwater  
 MC - McClung Warehouses  
 SG - Soil gas

Map Source:  
 Parcel Boundaries, City of Knoxville.  
 Aerial Imagery, Bing 2012-2013.



**United States  
 Environmental Protection Agency  
 Region 4**

**FIGURE 3**

**Sampling Locations**

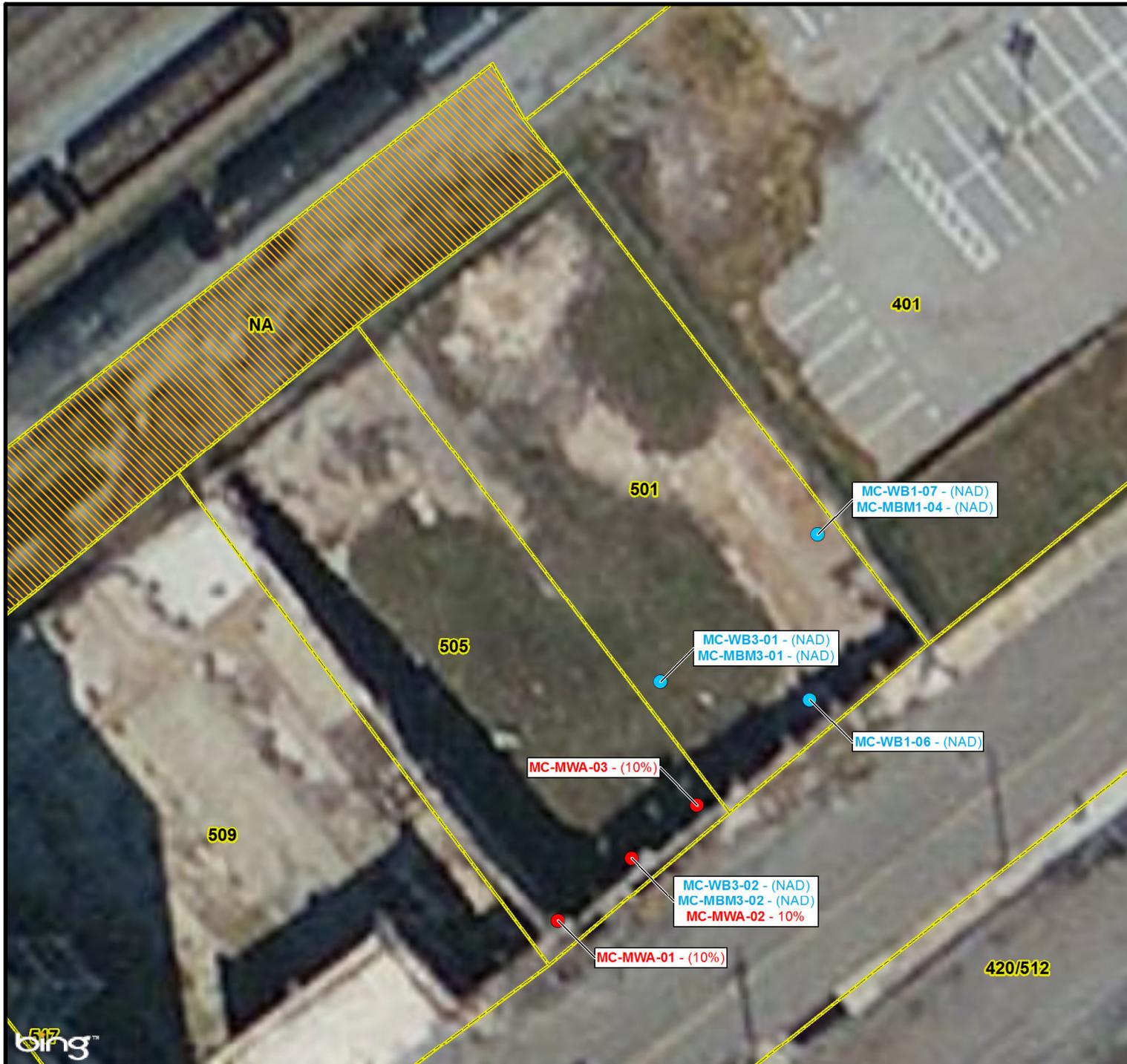
**TDD Name:** McClung Warehouses

**TDD No.:** TT-06-006

**City:** Knoxville     **County:** Knox     **State:** Tennessee

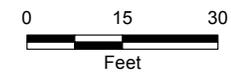


**Date:**  
7/3/2015  
**Analyst:**  
dale.vonbusch



**Legend**

- No Asbestos Detected
- Asbestos-Containing Material
- Parcel Boundary
- Option Tract



Map Source:  
Parcel Boundaries, City of Knoxville.  
Aerial Imagery, Bing 2012-2013.



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Region 4**

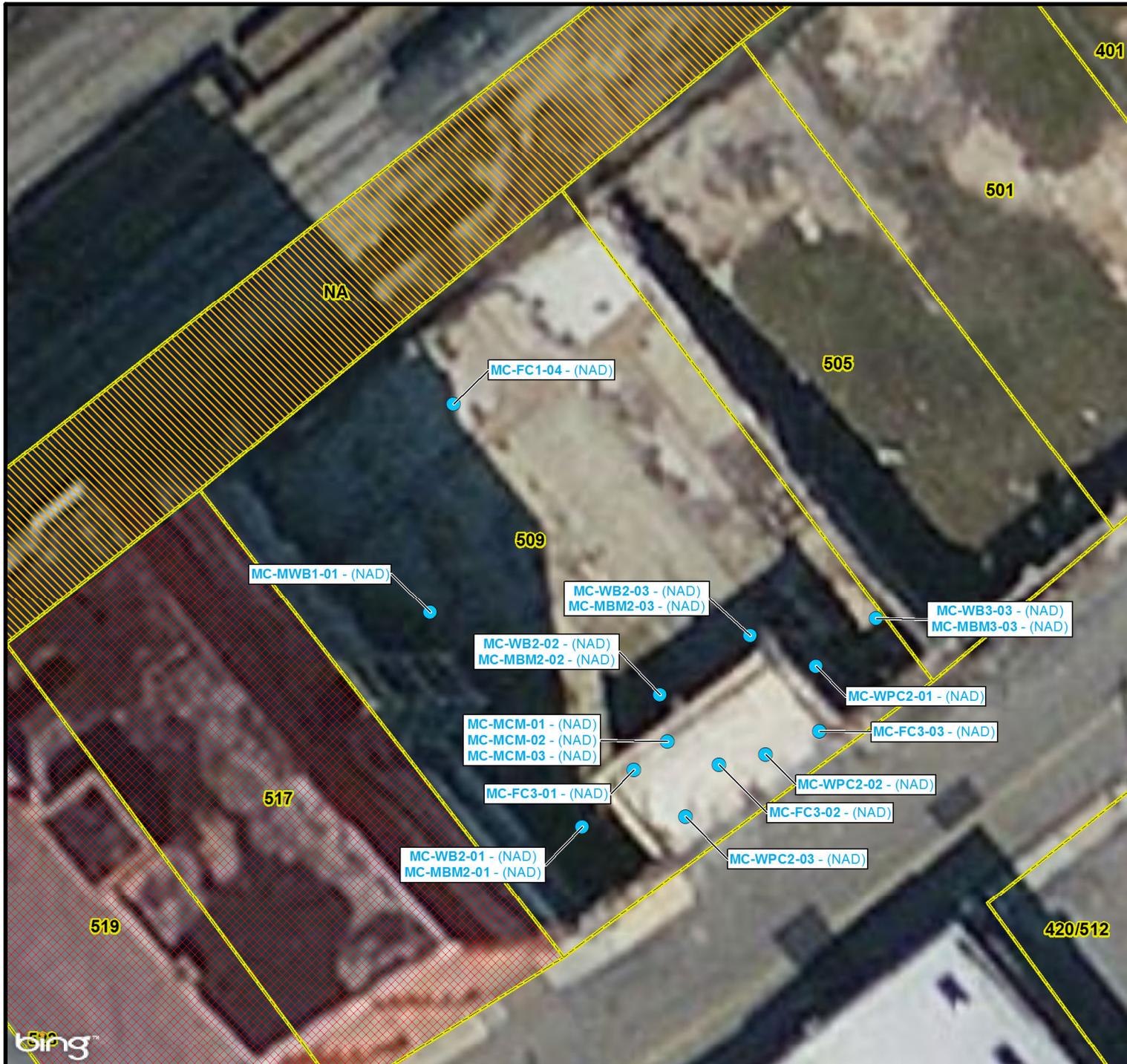
**FIGURE 4A**

**Asbestos Sampling Locations**

**TDD Name:** McClung Warehouses  
**TDD No.:** TT-06-006  
**City:** Knoxville    **County:** Knox    **State:** Tennessee

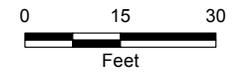
**TETRA TECH**  
**Date:** 6/29/2015  
**Analyst:** dale.vonbusch





**Legend**

- No Asbestos Detected
- Parcel Boundary
- Option Tract
- Former Buildings (no longer present)



Map Source:  
Parcel Boundaries, City of Knoxville.  
Aerial Imagery, Bing 2012-2013.



United States  
Environmental Protection Agency  
Region 4

**FIGURE 4B**

**Asbestos Sampling Locations**

**TDD Name:** McClung Warehouses

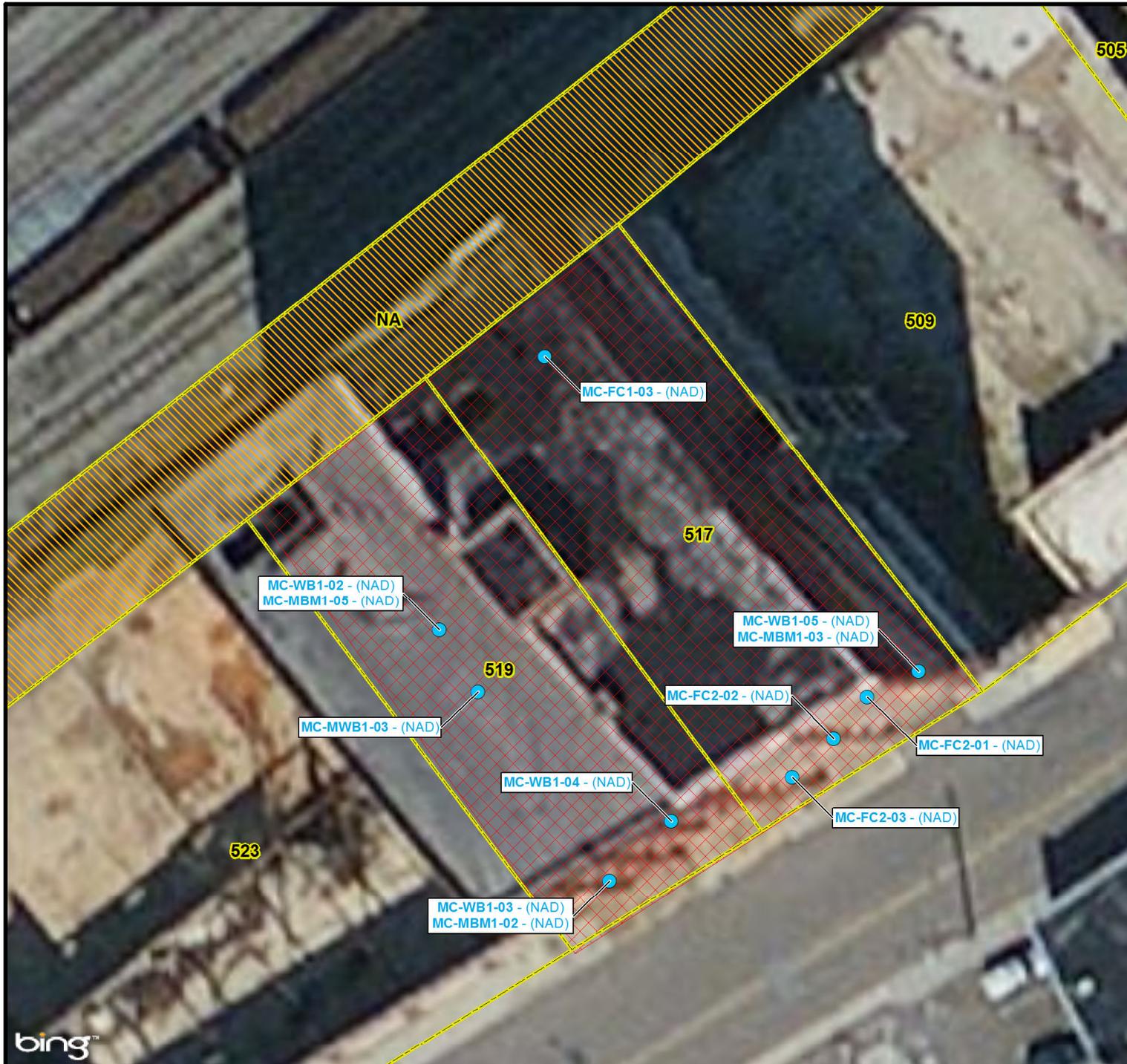
**TDD No.:** TT-06-006

**City:** Knoxville      **County:** Knox      **State:** Tennessee



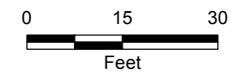
**TETRA TECH**

**Date:**  
6/29/2015  
**Analyst:**  
dale.vonbusch



**Legend**

- No Asbestos Detected
- Parcel Boundary
- Option Tract
- Former Buildings (no longer present)



Map Source:  
Parcel Boundaries, City of Knoxville.  
Aerial Imagery, Bing 2012-2013.



 **United States Environmental Protection Agency Region 4**

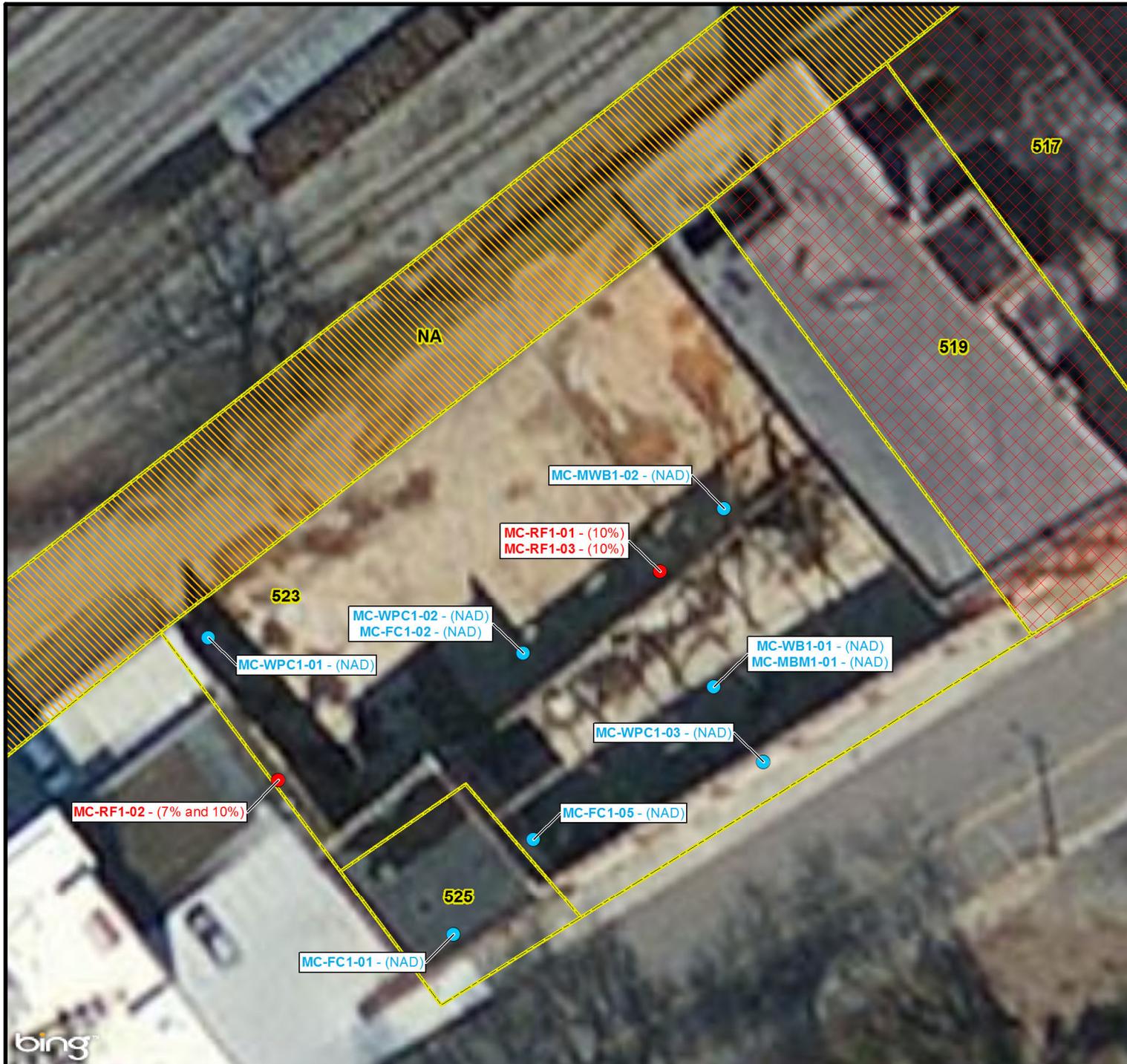
**FIGURE 4C**

**Asbestos Sampling Locations**

**TDD Name:** McClung Warehouses  
**TDD No.:** TT-06-006  
**City:** Knoxville    **County:** Knox    **State:** Tennessee

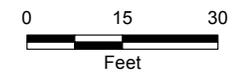
 **TETRA TECH**  
**Date:** 6/29/2015  
**Analyst:** dale.vonbusch





**Legend**

- No Asbestos Detected
- Asbestos-Containing Material
- Parcel Boundary
- Option Tract
- Former Buildings (no longer present)



Map Source:  
Parcel Boundaries, City of Knoxville.  
Aerial Imagery, Bing 2012-2013.



**United States Environmental Protection Agency Region 4**

**FIGURE 4D**

**Asbestos Sampling Locations**

**TDD Name:** McClung Warehouses  
**TDD No.:** TT-06-006  
**City:** Knoxville    **County:** Knox    **State:** Tennessee

**TETRA TECH**  
**Date:** 6/29/2015  
**Analyst:** dale.vonbusch

## APPENDIX B

### TABLES

(18 Pages)

#### TABLE

1	MONITORING WELL GROUNDWATER PARAMETERS
2	ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES
3	ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES
4	ANALYTICAL RESULTS FOR COMPOSITE SOIL SAMPLES
5	ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES
6	ANALYTICAL RESULTS FOR SOIL GAS SAMPLES
7	ANALYTICAL RESULTS FOR ASBESTOS SAMPLES
8	ANALYTICAL RESULTS FOR IDW SAMPLES

**TABLE 1**  
**McCLUNG WAREHOUSES**  
**MONITORING WELL GROUNDWATER PARAMETERS**

Well ID	Sample ID	Depth of Screen Interval	Total Well Depth	Depth to Water	Water Column	Purge Volume
		(feet bgs)	(feet bgs)	(feet bgs)	(feet)	(gallons)
MW-01	MC-GW-01	5 to 15	14.82	5.21	9.61	8
MW-05	MC-GW-05 MC-GW-05-DUP	5 to 15	14.95	9.30	5.65	6
MW-08	MC-GW-08*	5 to 15	15	NA	NA	NA

Notes:

- \* Groundwater was not sufficient to sample
- bgs Below ground surface
- DUP Duplicate
- GW Groundwater
- ID Identification
- MC McClung Warehouses
- MW Monitoring Well
- NA Not applicable

**TABLE 2**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES**

Analyte	EPA RSL <sup>1</sup> Residential Soil	EPA RSL <sup>2</sup> Industrial Soil	MC-SF-01	MC-SF-02	MC-SF-03	MC-SF-04	MC-SF-05
<b>Volatile Organic Compounds (µg/kg)</b>							
Methylene Chloride	35	320,000	5.5 U	5.6 U	5.6	5.7 U	5.2 U
<b>Semivolatile Organic Compounds (µg/kg)</b>							
Fluoranthene	230,000	3,000,000	440 U	450 U	410 U	450 U	6,800 J+
Phenanthrene	NL	NL	440 U	450 U	410 U	450 U	9,800 J+
Pyrene	170,000	2,300,000	440 U	450 U	410 U	450 U	5,500 J+
<b>Metals (mg/kg)</b>							
Aluminum	7,700	110,000	25,000	25,000	26,000	22,000	18,000
Arsenic	0.67	3	<b>17</b>	<b>18</b>	<b>12</b>	<b>14</b>	<b>28</b>
Barium	1,500	22,000	66	92	71	85	79
Beryllium	16	230	1.5	1.7	1.7	1.9	1.2
Cadmium	7	98	0.130	0.067 U	0.060	1.0	0.200
Calcium	NL	NL	13,000	4,500	4,400	25,000	5,500
Chromium <sup>1</sup>	12,000	180,000	43	34	30	31	29
Cobalt	2.3	35	<b>17</b>	<b>36</b>	<b>22</b>	<b>23</b>	<b>29</b>
Copper	310	4700	36	27	39	32	13
Iron	5,500	82,000	49,000	50,000	51,000	48,000	42,000
Lead <sup>2</sup>	400	800	42	32	16	160	36
Magnesium	NL	NL	3,400	3,300	3,400	4,600	1,300
Manganese	180	2,600	900	1,900	1,000	750	<b>2,700</b>
Mercury <sup>3</sup>	0.94	4	0.034	0.056	0.032	0.036	0.077
Nickel <sup>4</sup>	150	2,200	36	40	41	36	21
Potassium	NL	NL	2,300	1,900	2,200	1,700	1,800
Selenium	39	580	4.2	7	5.2	4.2	2
Sodium	NL	NL	120	94	57	71	190
Thallium	0.078	1.2	0.22	0.2	0.14	0.13	0.38
Vanadium	39	580	45	40	37	30	47
Zinc	2,300	35,000	82	90	110	420	57
<b>Polychlorinated biphenyls (µg/kg)</b>			ND	ND	ND	ND	ND
<b>Pesticides (µg/kg)</b>							
4,4'-DDE	1,600	6,800	2.3 U	2.3 U	2.1 U	2.3 U	2.1 U
4,4'-DDT	1,900	8,600	2.3 U	2.3 U	2.1 U	6.2	2.1 U
Aldrin	31	140	2.3 U	2.3 U	2.1 U	5.7	40
Dieldrin	33	140	2.3 U	2.3 U	2.1 U	2.9	2.1 U
<b>Herbicides (µg/kg)</b>			ND	ND	ND	ND	ND

**TABLE 2**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES**

Analyte	EPA RSL <sup>1</sup> Residential Soil	EPA RSL <sup>2</sup> Industrial Soil	MC-SF05-01	MC-SF06-01	MC-SF07-01	MC-SF08-01
<b>Volatile Organic Compounds (µg/kg)</b>						
Methylene Chloride	35	320,000	5.2 U	5.3 U	5.5 U	5.4 U
<b>Semivolatile Organic Compounds (µg/kg)</b>						
Fluoranthene	230,000	3,000,000	450 U	4,100 U	4,400 U	4,500 U
Phenanthrene	NL	NL	450 U	4,100 U	4,400 U	4,500 U
Pyrene	170,000	2,300,000	450 U	4,100 U	4,400 U	4,500 U
<b>Metals (mg/kg)</b>						
Aluminum	7,700	110,000	11,000	8,900	24,000	17,000
Arsenic	0.67	3	<b>34</b>	<b>10</b>	<b>19</b>	<b>21</b>
Barium	1,500	22,000	73	130	21	48
Beryllium	16	230	1.2	0.9	1.3	2.2
Cadmium	7	98	0.490	0.400	0.110	0.076
Calcium	NL	NL	48,000	80,000	2,800	11,000
Chromium <sup>1</sup>	12,000	180,000	19	16	22	15
Cobalt	2.3	35	17	7.6	7.4	13
Copper	310	4700	24	16	18	17
Iron	5,500	82,000	42,000	14,000	36,000	42,000
Lead <sup>2</sup>	400	800	42	67	32	32
Magnesium	NL	NL	2,800	4,300	1,500	1,700
Manganese	180	2,600	670	370	120	270
Mercury <sup>3</sup>	0.94	4	0.085	0.054	0.098	0.1
Nickel <sup>4</sup>	150	2,200	27	11	38	23
Potassium	NL	NL	2,400	960	2,600	2,600
Selenium	39	580	3.3	2	3.5	6.3
Sodium	NL	NL	300	130	33 U	29 U
Thallium	0.078	1.2	0.32	0.14	0.35	0.32
Vanadium	39	580	65	26	37	28
Zinc	2,300	35,000	140	190	54	51
<b>Polychlorinated biphenyls (µg/kg)</b>			ND	ND	ND	ND
<b>Pesticides (µg/kg)</b>						
4,4'-DDE	1,600	6,800	2.3 U	3.6	NA	NA
4,4'-DDT	1,900	8,600	13	8.5	NA	NA
Aldrin	31	140	2.3 U	2.1 U	NA	NA
Dieldrin	33	140	2.3 U	2.1 U	NA	NA
<b>Herbicides (µg/kg)</b>			ND	ND	ND	ND

**TABLE 2**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR SURFACE SOIL SAMPLES**

Notes:

<sup>1</sup>	Value listed is for Chromium III, insoluble salts
<sup>2</sup>	Value listed is for Lead and compounds
<sup>3</sup>	Value listed is for Mercury (elemental)
<sup>4</sup>	Value listed is for Nickel soluble salts
EPA	U.S. Environmental Protection Agency
HQ	Hazard quotient
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high
µg/kg	Micrograms per kilogram
MC	McClung Warehouses
mg/kg	Milligrams per kilogram
NA	Not analyzed
ND	Not detected; the analyte was not detected at or above the reporting limit
NL	Not listed
RSL <sup>1</sup>	Residential Regional Screening Level, June 2015, HQ = 0.1
RSL <sup>2</sup>	Industrial Regional Screening Level, June 2015, HQ = 0.1
SF	Surface soil
U	The analyte was not detected at or above the associated value (reporting limit [RL])
	Shaded values equal or exceed the RSL <sup>1</sup>
<b>BOLD</b>	Bold values equal or exceed the RSL <sup>2</sup>

**TABLE 3**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES**

Analyte	EPA RSL <sup>1</sup> Residential Soil	EPA RSL <sup>2</sup> Industrial Soil	MC-SB01-05	MC-SB02-09	MC-SB03-09	MC-SB04-09	MC-SB05-20
<b>Volatile Organic Compounds (µg/kg)</b>			ND	ND	ND	ND	ND
<b>Semivolatile Organic Compounds (µg/kg)</b>			ND	ND	ND	ND	ND
<b>Metals (mg/kg)</b>							
Aluminum	7,700	110,000	22,000	25,000	27,000	23,000	22,000
Arsenic	0.67	3	<b>17</b>	<b>12</b>	<b>22</b>	<b>32</b>	<b>36</b>
Barium	1,500	22,000	68	110	140	75	180
Beryllium	16	230	1.0	2.2	2.6	2.8	5.8
Cadmium	7	98	0.065 U	0.061 U	0.075	0.088	0.990
Calcium	NL	NL	1,600	1,500	1,900	430	8,600
Chromium <sup>1</sup>	12,000	180,000	36	26	32	30	33
Cobalt	2.3	35	<b>45</b>	<b>27</b>	<b>28</b>	<b>16</b>	<b>17</b>
Copper	310	4,700	19	32	25	26	31
Iron	5,500	82,000	<b>44,000</b>	<b>48,000</b>	<b>52,000</b>	<b>54,000</b>	<b>61,000</b>
Lead <sup>2</sup>	400	800	41	25	49	40	41
Magnesium	NL	NL	1,900	3,800	5,100	3,300	1,400
Manganese	180	2,600	<b>2,200</b>	<b>1,400</b>	<b>1,000</b>	<b>600</b>	<b>3,000</b>
Mercury <sup>3</sup>	0.94	4	0.037	0.024 U	0.024 U	0.033	0.094
Nickel <sup>4</sup>	150	2,200	22	53	67	49	72
Potassium	NL	NL	1,500	2,100	2,300	1,900	2,500
Selenium	39	580	3.5	10	17	5.5	19
Sodium	NL	NL	66	130	77	53	47
Thallium	0.078	1.2	<b>0.25</b>	<b>0.14</b>	<b>0.17</b>	<b>0.18</b>	<b>0.41</b>
Vanadium	39	580	<b>44</b>	32	32	33	<b>55</b>
Zinc	2,300	35,000	59	120	140	160	140
<b>Polychlorinated biphenyls (µg/kg)</b>			ND	ND	ND	ND	ND
<b>Pesticides (µg/kg)</b>			ND	ND	ND	ND	ND
<b>Herbicides (µg/kg)</b>			ND	ND	ND	ND	ND

**TABLE 3**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES**

Analyte	EPA RSL <sup>1</sup> Residential Soil	EPA RSL <sup>2</sup> Industrial Soil	MC-SB05-09	MC-SB06-04	MC-SB07-14	MC-SB08-09
<b>Volatile Organic Compounds (µg/kg)</b>			ND	ND	ND	ND
<b>Semivolatile Organic Compounds (µg/kg)</b>			ND	ND	ND	ND
<b>Metals (mg/kg)</b>						
Aluminum	7,700	110,000	19,000	14,000	24,000	19,000
Arsenic	0.67	3	<b>150</b>	<b>20</b>	<b>41</b>	<b>14</b>
Barium	1,500	22,000	34	140	49	70
Beryllium	16	230	2.6	1.7	3.0	8.2
Cadmium	7	98	0.100	0.120	0.160	0.2
Calcium	NL	NL	910	40,000	150	1,800
Chromium <sup>1</sup>	12,000	180,000	29	29	30	21
Cobalt	2.3	35	26	19	29	16
Copper	310	4,700	22	44	25	15
Iron	5,500	82,000	74,000	40,000	57,000	37,000
Lead <sup>2</sup>	400	800	52	100	39	17
Magnesium	NL	NL	1,000	3,500	1,100	3,600
Manganese	180	2,600	570	1,400	1,100	710
Mercury <sup>3</sup>	0.94	4	0.110	0.074	0.120	0.044
Nickel <sup>4</sup>	150	2,200	29	22	40	44
Potassium	NL	NL	2,300	1,600	2,100	3,700
Selenium	39	580	4	4.1	13	13
Sodium	NL	NL	62	100	51	36
Thallium	0.078	1.2	0.41	0.21	0.6	0.32
Vanadium	39	580	47	50	64	24
Zinc	2,300	35,000	70	64	81	65
<b>Polychlorinated biphenyls (µg/kg)</b>			ND	ND	ND	ND
<b>Pesticides (µg/kg)</b>			ND	ND	ND	ND
<b>Herbicides (µg/kg)</b>			ND	ND	ND	ND

**TABLE 3**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES**

Notes:

<sup>1</sup>	Value listed is for Chromium III, insoluble salts
<sup>2</sup>	Value listed is for Lead and compounds
<sup>3</sup>	Value listed is for Mercury (elemental)
<sup>4</sup>	Value listed is for Nickel soluble salts
EPA	U.S. Environmental Protection Agency
HQ	Hazard quotient
µg/kg	Micrograms per kilogram
MC	McClung Warehouses
mg/kg	Milligrams per kilogram
ND	Not detected; the analyte was not detected at or above the reporting limit
NL	Not listed
RSL <sup>1</sup>	Residential Regional Screening Level, June 2015, HQ = 0.1
RSL <sup>2</sup>	Industrial Regional Screening Level, June 2015, HQ = 0.1
SB	Subsurface soil
U	The analyte was not detected at or above the associated value (reporting limit [RL]).
	Shaded values equal or exceed the RSL <sup>1</sup>
<b>BOLD</b>	Bold values equal or exceed the RSL <sup>2</sup>

**TABLE 4**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR COMPOSITE SURFACE SOIL SAMPLES**

Analyte	EPA RSL <sup>1</sup> Residential Soil	EPA RSL <sup>2</sup> Industrial Soil	MC-COM-01	MC-COM-01-DUP	MC-COM-02
<b>Volatile Organic Compounds (µg/kg)</b>			ND	ND	ND
<b>Semivolatile Organic Compounds (µg/kg)</b>					
Fluoranthene	230,000	3,000,000	7,700	4,900	4,300 UJ
Phenanthrene	NL	NL	5,400	4,400 U	4,300 UJ
Pyrene	170,000	2,300,000	6,100	4,400 U	4,300 UJ
<b>Metals (mg/kg)</b>					
Aluminum	7,700	110,000	9,500	11,000	7,300
Arsenic	0.67	3	27	27	45
Barium	1,500	22,000	210	180	240
Beryllium	16	230	0.7	0.9	1.1
Cadmium	7	98	1.4	1.7	1.5
Calcium	NL	NL	100,000	110,000	26,000
Chromium <sup>1</sup>	12,000	180,000	24	28	18 J+
Cobalt	2.3	35	11	12	10 J+
Copper	310	4,700	83	70	76
Iron	5,500	82,000	28,000	34,000	26,000
Lead <sup>2</sup>	400	800	310	420	300
Magnesium	NL	NL	4,700	7,200	2,700
Manganese	180	2,600	740	980	500
Mercury <sup>3</sup>	0.94	4	0.29 J	0.53 J	0.19 J-
Nickel <sup>4</sup>	150	2,200	18	24	21 J-
Potassium	NL	NL	1,600	1,400	1,500 J+
Selenium	39	580	2.7	3.2	3
Silver	39	580	0.13	0.12 U	0.15
Sodium	NL	NL	92	90	100
Thallium	0.078	1.2	0.14	0.16	0.39
Vanadium	39	580	20	24	26 J+
Zinc	2,300	35,000	540	710	520
<b>Polychlorinated biphenyls (µg/kg)</b>			ND	ND	ND
<b>Pesticides (µg/kg)</b>			ND	ND	ND
<b>Herbicides (µg/kg)</b>			ND	ND	ND

**TABLE 4**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR COMPOSITE SURFACE SOIL SAMPLES**

Notes:

<sup>1</sup>	Value listed is for Chromium III, insoluble salts
<sup>2</sup>	Value listed is for Lead and compounds
<sup>3</sup>	Value listed is for Mercury (elemental)
<sup>4</sup>	Value listed is for Nickel soluble salts
EPA	U.S. Environmental Protection Agency
HQ	Hazard quotient
J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low
µg/kg	Micrograms per kilogram
MC	McClung Warehouses
mg/kg	Milligrams per kilogram
ND	Not detected; the analyte was not detected at or above the reporting limit
NL	Not listed
RSL <sup>1</sup>	Residential Regional Screening Level, June 2015, HQ = 0.1
RSL <sup>2</sup>	Industrial Regional Screening Level, June 2015, HQ = 0.1
SB	Subsurface soil
U	The analyte was not detected at or above the associated value (reporting limit [RL])
UJ	The analyte was not detected at or above the associated value (reporting limit [RL]), which is considered approximate due to deficiencies in one or more quality items
	Shaded values equal or exceed the RSL <sup>1</sup>
<b>BOLD</b>	Bold values equal or exceed the RSL <sup>2</sup>

**TABLE 5**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES**

Analyte	EPA MCL	MC-GW-01	MC-GW-05	MC-GW-05-DUP
<b>Volatile Organic Compounds (µg/L)</b>		ND	ND	ND
<b>Semivolatile Organic Compounds (µg/L)</b>		ND	ND	ND
<b>Metals (µg/L)</b>				
Aluminum	NL	310	220	250
Barium	2,000	33	65	74
Calcium	NL	37,000	110,000	120,000
Cobalt	NL	32	0.65	0.72
Iron	NL	300	250	290
Magnesium	NL	6,600	6,400	7,100
Manganese	NL	5,100	27	30
Nickel <sup>4</sup>	NL	5.2	5 U	5 U
Potassium	NL	4,600	2,600	2,800
Sodium	NL	15,000	26,000	29,000
Zinc	NL	26	20 U	20 U
<b>Polychlorinated biphenyls (µg/L)</b>		ND	ND	ND
<b>Pesticides (µg/L)</b>		ND	ND	ND
<b>Herbicides (µg/L)</b>		ND	ND	ND

**TABLE 5**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES**

Notes:

DUP	Duplicate
EPA	U.S. Environmental Protection Agency
µg/L	Micrograms per Liter
MC	McClung Warehouses
MCL	Maximum Contaminant Level for drinking water, May 2009
NA	Not applicable
ND	Not detected
NL	Not listed
U	The analyte was not detected at or above the associated value (reporting limit [RL]).
<b>BOLD</b>	Bold values indicate values equal or exceed the associated MCL.

**TABLE 6  
McCLUNG WAREHOUSES  
ANALYTICAL RESULTS FOR SOIL GAS SAMPLES**

Constituent of Potential Concern	2-Butanone (MEK)	Acetone	Benzene	Cyclohexane	Ethylbenzene
<b>Regional Screening Level (RSL) Cancer Screening Level for Residential Air (ug/m<sup>3</sup>), 10<sup>-6</sup> risk, alpha of 0.03</b>	NA	NA	12	NA	37
<b>RSL Non Cancer Screening Level for Residential Air (ug/m<sup>3</sup>), HI = 0.10, alpha of 0.03</b>	17,333	106,667	103	21,000	3,333
<b>RSL Cancer Screening Level for Industrial Air (ug/m<sup>3</sup>), 10<sup>-6</sup> risk, alpha of 0.03</b>	NA	NA	53	NA	163
<b>RSL Non Cancer Screening Level for Industrial Air (ug/m<sup>3</sup>), HI = 0.10, alpha of 0.03</b>	73,333	466,667	433	86,667	14,667
<b>Sample ID</b>	<b>Sample Results (ug/m<sup>3</sup>)</b>				
MC-SG-01	29 U	120 U	18	31	8.7 U
MC-SG-02	47	250	6.3	16 U	8.3 U
MC-SG-03	27 U	110 U	5.8 U	16 U	7.9 U
MC-SG-03-SP	28 U	110 U	6.1 U	16 U	8.3 U
MC-SG-04	190.00	48	30	25	13
MC-SG-05	29 U	120 U	6.4 U	17 U	8.7 U
MC-SG-06	27 U	110 U	5.9	16 U	7.9 U

**TABLE 6  
McCLUNG WAREHOUSES  
ANALYTICAL RESULTS FOR SOIL GAS SAMPLES**

Constituent of Potential Concern	Methylcyclohexane	Naphthalene	Styrene	Toluene	Xylenes
<b>Regional Screening Level (RSL) Cancer Screening Level for Residential Air (ug/m<sup>3</sup>), 10<sup>-6</sup> risk, alpha of 0.03</b>	NA	NA	NA	NA	NA
<b>RSL Non Cancer Screening Level for Residential Air (ug/m<sup>3</sup>), HI = 0.10, alpha of 0.03</b>	NA	NA	3,333	17,333	333
<b>RSL Cancer Screening Level for Industrial Air (ug/m<sup>3</sup>), 10<sup>-6</sup> risk, alpha of 0.03</b>	NA	NA	NA	NA	NA
<b>RSL Non Cancer Screening Level for Industrial Air (ug/m<sup>3</sup>), HI = 0.10, alpha of 0.03</b>	NA	NA	14,667	73,333	1,467
Sample ID	Sample Results (ug/m <sup>3</sup> )				
MC-SG-01	35	26 U	8.5 U	9.8	17 U
MC-SG-02	21	25 U	8.1 U	78	17 U
MC-SG-03	10	24 U	7.7 U	6.9 U	16 U
MC-SG-03-SP	11	25 U	8.1 U	7.2 U	17 U
MC-SG-04	16	140	9	49	56
MC-SG-05	13	26 U	8.5 U	7.5 U	17 U
MC-SG-06	23	78	7.7 U	27	16 U

**TABLE 6**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR SOIL GAS SAMPLES**

Notes:

HI	Hazard Index
MC	McClung Warehouses
NA	Not Applicable
RSL	Regional Screening Level, June 2015, HQ = 0.1
SG	Soil gas
SP	Split sample
µg/m <sup>3</sup>	Micrograms per meter cubed
U	The analyte was not detected at or above the associated value (reporting limit [RL])
	Exceeds residential soil gas screening levels and SCDM benchmarks.

An attenuation factor (alpha) of 0.03 was used to derive the soil gas screening levels from the corresponding air RSLs and benchmarks.

**TABLE 7**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR ASBESTOS SAMPLES**

HA	SAMPLE NUMBER	MATERIAL DESCRIPTION	ASBESTOS DETECTED BY PLM	FRIABLE	NON-ASBESTOS MATERIAL PRESENT	BUILDING	LOCATION
1	MC-WB1-01	Brick Wall -Red	ND	NA	See detailed laboratory sheet in Appendix E	523	Center of upper level from ground
	MC-WB1-02		ND	NA	See detailed laboratory sheet in Appendix E	519	Lower level from ground
	MC-WB1-03		ND	NA	See detailed laboratory sheet in Appendix E	519	Upper level at sidewalk from wall
	MC-WB1-04		ND	NA	See detailed laboratory sheet in Appendix E	517	End of southwest wall
	MC-WB1-05		ND	NA	See detailed laboratory sheet in Appendix E	517	End of northeast wall
	MC-WB1-06		ND	NA	See detailed laboratory sheet in Appendix E	501	Center of side wall by sidewalk
	MC-WB1-07		ND	NA	See detailed laboratory sheet in Appendix E	501	At end of northeast wall
2	MC-WB2-01	Brick Wall -Dark Red	ND	NA	See detailed laboratory sheet in Appendix E	509	Center southwest wall
	MC-WB2-02		ND	NA	See detailed laboratory sheet in Appendix E	509	Center wall north end
	MC-WB2-03		ND	NA	See detailed laboratory sheet in Appendix E	509	End of northeast wall
3	MC-WB3-01	Brick Wall-Black	ND	NA	See detailed laboratory sheet in Appendix E	505	East side of south wall at sidewalk
	MC-WB3-02		ND	NA	See detailed laboratory sheet in Appendix E	505	Center of south wall at sidewalk
	MC-WB3-03		ND	NA	See detailed laboratory sheet in Appendix E	505	West side of south wall at sidewalk
4	MC-MWA-01	Miscellaneous-Wall Adhesive-Black	10% Chrysotile	No	See detailed laboratory sheet in Appendix E	505	Southwest corner, upper level at sidewalk
	MC-MWA-02		10% Chrysotile	No	See detailed laboratory sheet in Appendix E	505	Center upper level at sidewalk
	MC-MWA-03		10% Chrysotile	No	See detailed laboratory sheet in Appendix E	505	Northeast corner upper level at sidewalk
5	MC-MBM1-01	Brick Mortar-Red Brick	ND	NA	See detailed laboratory sheet in Appendix E	523	Center of upper level from ground
	MC-MBM1-02		ND	NA	See detailed laboratory sheet in Appendix E	519	Upper level at sidewalk from wall
	MC-MBM1-03		ND	NA	See detailed laboratory sheet in Appendix E	517	End of northeast wall
	MC-MBM1-04		ND	NA	See detailed laboratory sheet in Appendix E	501	At end of northeast wall
	MC-MBM1-05		ND	NA	See detailed laboratory sheet in Appendix E	519	Lower level from ground
6	MC-MBM2-01	Brick Mortar-Dark Red Brick	ND	NA	See detailed laboratory sheet in Appendix E	509	Center southwest wall
	MC-MBM2-02		ND	NA	See detailed laboratory sheet in Appendix E	509	Center wall north end
	MC-MBM2-03		ND	NA	See detailed laboratory sheet in Appendix E	509	End of northeast wall
7	MC-MBM3-01	Brick Mortar-Black	ND	NA	See detailed laboratory sheet in Appendix E	505	East side of south wall at sidewalk
	MC-MBM3-02		ND	NA	See detailed laboratory sheet in Appendix E	505	Center of south wall at sidewalk
	MC-MBM3-03		ND	NA	See detailed laboratory sheet in Appendix E	505	West side of south wall at sidewalk
8	MC-MCM-01	Miscellaneous Ceiling Mortar	ND	NA	See detailed laboratory sheet in Appendix E	509	From floor of upper southwest room
	MC-MCM-02		ND	NA	See detailed laboratory sheet in Appendix E	509	From floor of upper southwest room
	MC-MCM-03		ND	NA	See detailed laboratory sheet in Appendix E	509	From floor of upper southwest room

**TABLE 7**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR ASBESTOS SAMPLES**

HA	SAMPLE NUMBER	MATERIAL DESCRIPTION	ASBESTOS DETECTED BY PLM	FRIABLE	NON-ASBESTOS MATERIAL PRESENT	BUILDING	LOCATION
9	MC-RF1-01 <sup>a</sup>	Roof Flashing	10% Chrysotile	No	See detailed laboratory sheet in Appendix E	523	East side of center lower level wall
	MC-RF1-02 <sup>a</sup>		7% and 10% Chrysotile	No	See detailed laboratory sheet in Appendix E	523	Center of west wall lower level
	MC-RF1-03 <sup>a</sup>		10% Chrysotile	No	See detailed laboratory sheet in Appendix E	523	East side of center lower level wall
10	MC-MWB1-01	Miscellaneous Wall Brick-Yellow (Tiger Crown)	ND	NA	See detailed laboratory sheet in Appendix E	509	Center of west debris pile
	MC-MWB1-02		ND	NA	See detailed laboratory sheet in Appendix E	523	Center east side of northeast debris pile
	MC-MWB1-03		ND	NA	See detailed laboratory sheet in Appendix E	517	Center east side of northeast debris pile
11	MC-WPC1-01	Poured Concrete Wall-Exterior Smooth	ND	NA	See detailed laboratory sheet in Appendix E	523	Northwest corner of lower level wall
	MC-WPC1-02		ND	NA	See detailed laboratory sheet in Appendix E	523	Center of south lower level wall
	MC-WPC1-03		ND	NA	See detailed laboratory sheet in Appendix E	523	Center south upper level wall
12	MC-WPC2-01	Poured Concrete Wall-Interior Smooth	ND	NA	See detailed laboratory sheet in Appendix E	517	Center column northeast wall
	MC-WPC2-02		ND	NA	See detailed laboratory sheet in Appendix E	517	Center column center wall
	MC-WPC2-03		ND	NA	See detailed laboratory sheet in Appendix E	517	Center column southwest wall
13	MC-FC1-01	Concrete Floor-Smooth	ND	NA	See detailed laboratory sheet in Appendix E	525	Center of east side
	MC-FC1-02		ND	NA	See detailed laboratory sheet in Appendix E	523	Center of south end lower level
	MC-FC1-03		ND	NA	See detailed laboratory sheet in Appendix E	517	Center northwest area near railroad tracks
	MC-FC1-04		ND	NA	See detailed laboratory sheet in Appendix E	509	Center northwest area near railroad tracks
	MC-FC1-05		ND	NA	See detailed laboratory sheet in Appendix E	523	Center of west side of upper level
14	MC-FC2-01	Concrete Floor-Large Rectangular Pattern	ND	NA	See detailed laboratory sheet in Appendix E	517	Northeast corner upper level
	MC-FC2-02		ND	NA	See detailed laboratory sheet in Appendix E	517	Center upper level
	MC-FC2-03		ND	NA	See detailed laboratory sheet in Appendix E	517	Southwest corner upper level
15	MC-FC3-01 <sup>a</sup>	Concrete Floor-Small Rectangular Pattern	ND	NA	See detailed laboratory sheet in Appendix E	509	Northwest corner upper level
	MC-FC3-02		ND	NA	See detailed laboratory sheet in Appendix E	509	Center upper level
	MC-FC3-03		ND	NA	See detailed laboratory sheet in Appendix E	509	Southeast corner upper level

**TABLE 7**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR ASBESTOS SAMPLES**

**NOTES**

<sup>a</sup>	Multiple layers were analyzed and found to contain asbestos fibers
%	Percent
FC	Floor concrete
HA	Homogeneous area
MBM	Miscellaneous brick mortar
MC	McClung Warehouses
MCM	Miscellaneous ceiling mortar
MWA	Miscellaneous wall adhesive
MWB	Miscellaneous wall brick
NA	Not applicable
ND	No fibers detected
PLM	Polarized Light Microscopy
RF	Roof flashing
WB	Wall brick
WPC	Wall poured concrete
	Shaded values exceed the definition of ACM found in 40 CFR Part 763.83

**TABLE 8**  
**McCLUNG WAREHOUSES**  
**ANALYTICAL RESULTS FOR IDW SAMPLES**

Analyte	EPA TCLP Limits <sup>1</sup>	MC-IDW-WATER
TCLP Volatile Organic Compounds		ND
TCLP Semivolatile Organic Compounds		ND
TCLP Herbicide and Pesticide Compounds		ND
<b>TCLP Metals (µg/L)</b>		
Barium	100	49

Notes:

- <sup>1</sup> EPA 40 CFR 261.24 regulatory limits
- µg/L Micrograms per liter
- CFR *Code of Federal Regulations*
- EPA U.S. Environmental Protection Agency
- IDW Investigation-derived Waste
- NA Not applicable
- ND Not detected at or above the Method Detection Limit
- TCLP Toxicity Characteristic Leaching Procedure

**APPENDIX C**  
**LOGBOOK NOTES AND FIELD SHEETS**  
(19 Sheets)



*Rite in the Rain*

ALL-WEATHER  
**UNIVERSAL**

Nº 371

McClung Warehouses  
103 X 902 706004



11/14/15 McClung Warehouses S. Thomas

07:45 START Satara Thomas departs  
Ouluth, GA and travels to Knoxville, TN  
0849 Arrive at 400 Main Street (Ste 655)  
to meet with Anne Wallace Project  
Manager, Bob Whetsel and Erin  
Sutton of TDEC.

weather: 28°F, Cold, Clear and sunny  
workplan Meet with City of Knoxville  
personnel & TDEC to discuss  
history of site, operations, future  
uses of property and conduct site  
recon.

0905 meeting begins. Facts discussed  
about the site include the following.

- City acquired property that is called Option Track and Parking Lot tract (401 W. Jackson) Option Track is land behind warehouses that goes under overpasses N. Broadway and Oak Avenue
- 501, 505, 509 - Fire destroy these in 2007
- 517, 519, 523, 525 - Fire destroyed these in 2014.
- Attendees want sampling plan to be reviewed by them first before it goes to EPA.
- Need to contact additional parties that

Scale: 1 square = \_\_\_\_\_

11/14/15 McClung Warehouses S. Thomas

do not fall under TDEC. 1) Record of  
Corrective Action. 2) Dry Cleaner Program. 3)  
State Remediation Program in Nashville. Erin  
Sutton will forward my FOIA Request to  
these parties

- Sampling needs to include metals, PAHs, herbicides/pesticides
- 512 and 420 W. Jackson is a poorly paved parking lot
- Railroad is active, Norfolk Southern
- Intended use is mix use. Retail Commercial/office use, residential, parking and public park/greenway
- In 1992 aerial, RR shed is gone but a temp storage shed is now present
- 509 W. Jackson was a cabinet maker. Operated up to the 2007 fire. His space contained solvents & stains. Owner was Ernie Cross.
- Need to research utilities on site. Bob Whetsel provided contact info for Knoxville Utility Board (KUB).  
Derwin Haggood <sup>ST (865)</sup> -594 7534-D; 865-679-8776-C  
KUB uses a yellow polyline for gas.

Scale: 1 square = \_\_\_\_\_

*Rite in the Rain*

11/16/15 McClung Warehouses S. Thomas

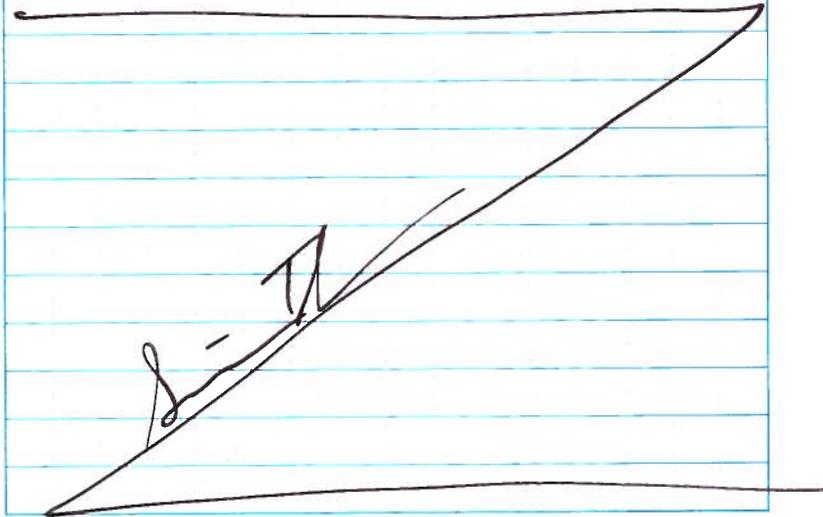
• 555 W. Jackson Ave, Southeastern  
Class

1026 Meeting adjourned and Anne  
Wallace and Bob Whetsel will meet  
with meet<sup>ST</sup> at site to conduct  
site reconnaissance.

1050 Begin site recon with Anne and Bob  
see Environmental Checklist.

1215 Site visit complete. START  
Thomas begin travels back to  
Ouluth, GA.

1650 START Thomas arrives back  
in Ouluth, GA. End of day.



Scale: 1 square = \_\_\_\_\_

03/23/15 McClung Warehouses S. Thomas

0500 START Thomas arrives at office  
in Ouluth, GA to load van for site  
visit, Phase II sampling event.

0530 START Thomas and L. Shaver depart  
office and travel to Knoxville, TN.

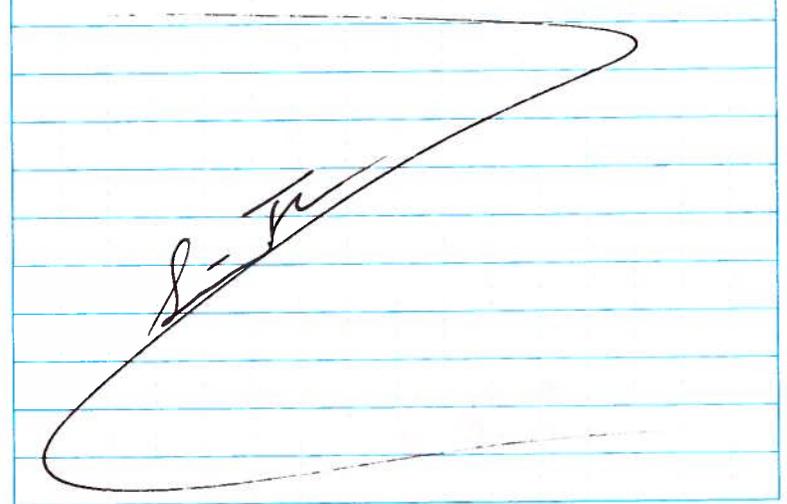
0700 START Snyder on site in  
Knoxville, TN. Meets with Terrence Hall of  
Geosearch<sup>(S)</sup>  
weather Clear, calm, 50°F

0705 H+S meeting. Utility clearance

0715 START Snyder marks boring  
locations for clearance.

0820 Geosearch offsite.

0930 START Thomas and Shaver on site.



Scale: 1 square = \_\_\_\_\_

*Rite in the Rain*

3/23/15 McClung Warehouses S. Thomas

0950 START & begins leak testing Summa  
Canisters.

1030 m+w Drilling arrive on site. START  
crew and m+w discuss field activities  
and conduct tailgate meeting.

1055 Leak testing complete for Summa Canisters

1115 Drillers begin at MC-02

1130 - Collect MC-SF-02

1135 - Collect MC-SB02-09 from 9-10' bgs

1155 - Collect MC-SF-03

1200 - Collect MC-SB03-09 from 9-10' bgs

1220 START and drill crew break for lunch.

1300 Return from lunch and begin work on sampling  
location MC-SG-02.

1402 Drillers begin purging line 3-well volumes, depth  
is 6.5 feet below paved surface. Removed 3  
cubic inches of purged air. Groundwater present @ ~7 feet

1412 Begin sample collect of soil gas at MC-SG-02.

1443 Purge 3-well volumes, 3 cubic feet. Depth to  
groundwater approximately 7 feet.

1448 Begin sample collection of soil gas at MC-SG-01

1505 - Collect MC-SF-01

1510 - Collect MC-SB01-05

Scale: 1 square = \_\_\_\_\_

3/23/15 McClung Warehouses S. Thomas

MC-02 3/23/15 11:15

0-2 - Asphalt, fill

2-4 - Yellow clay

4-5 - Yellow silty clay, dry

5-8 - " " " "

8-10 - " " " saturated

- no elevated VOC readings on 0-10' soil core

~~1130 - Collect~~

MC-03 3/23/15 11:45

0-2 - Asphalt, fill

2-5 - Dry, uniform, yellow-brown clay

5-7 - " " " "

7-10 - Wet/SAT " " " "

- no elevated screening levels

---

MC-01 3/23/15 1500

0-3 - Gravel

3-5 - Smooth brown homogeneous clay, dry

5-6 - " " " "

6-10 " " " saturated

10-13 " " " "

13-15 Smooth, uniform grey clay, saturated

No elevated readings

Scale: 1 square = \_\_\_\_\_

*Rite in the Rain*

3/23/15 McClung Warehouses S. Thomas

1515 - Set 1' temp well @ MC-01.  
15' total depth. 10' screen under 5'  
of rizer. 1' PVC w/ 0.010' slot

1533 Started second Summa canister at MC-SG-01. First  
canister failed.

1534 Crew begins drilling through concrete  
foundation at 517/519 at MC-GW-05. Strong  
creosote odor detected at drilling.

1605 - Collect MC-SF-05

1610 - Collect MC-SBDS-20 from 20-21' bgs

1610 - Stopped second Summa canister at MC-SG-01.  
second canister failed. Driller explained our  
tubing/probe tip under water. will try again  
tomorrow.

1730 off site to drop samples at FedEx location.  
Site secured.

1755 Samples dropped off at FedEx. End of day

Late Notes: Drill refusal at MC-GW-05. No  
(SE) groundwater present. Tetra Tech will  
wait until the morning of 3/24/15 to see  
if groundwater collects in well. Soil  
gas locations purged 3 cubic volumes  
based on well tubing. And surface samples  
collected 2 feet below paved surface.

Scale: 1 square = \_\_\_\_\_

3/23/15 McClung Warehouses S. Thomas

GW-05 ~~2/2~~ 3/23/15 1535

0-1 Concrete

1-2 Back fill

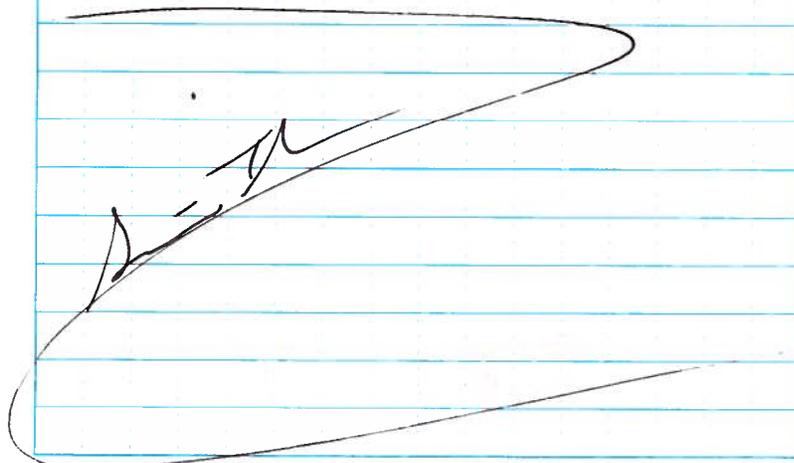
2-5 Smooth dry uniform clay, brown  
(creosote odor)

5-10 - Uniform brown clay, swelling, extremely tight

10-21 - "

Refusal @ 21' bgs

Notes: Continued, because the 1 foot  
(SE) interval contained pavement and backfill.  
1518 Completed sample collect  
MC-SG-02, Drillers - Richard  
Lane & James Scott.



Scale: 1 square = \_\_\_\_\_

Rite in the Rain

3/24/15 McC lung Warehouses S. Thomas

0700 START crew and drillers arrive on site. Hold H&amp;S meeting.

weather 55°F and cool, Clear skies. Highs in the low 70's

work plan Continue sampling activities. Try to collect Soil gas sample again at MC-SG-01.

0730 Depth to groundwater at MC-SG-01 is 8' ±. 5.5 feet. Soil gas tubing will be set at around 5 feet.

START begins groundwater preparations at MC-GW-01. Snyder begins calibrating YSI.

0757 Summa Canister started at MC-SG-01.

0800 Groundwater purge begins at MC-GW-01.

Groundwater depth is 5 feet. See field sheets

~~SPD~~  
~~0850~~ Bump test performed on FID. FID reading within range

0900 Collect MC-SF08-01, No elevated readings

0913 Collect MC-SB08-09, No elevated readings

1000 Collect MC-SF07-01

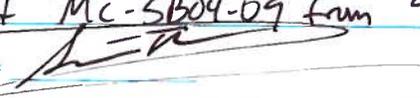
1010 Collect MC-SB07-14

\* 0913 Late Note, Sample collection ends at MC-SG-01

⑤ 0950 Sample collected at MC-GW-01 w/MSMSD

1125 - Collect MC-SF04-01

1155 - Collect MC-SB04-09 from 9-10' bgs

Scale: 1 square = 

3/24/15 McC lung Warehouses S. Thomas

MC07 3/24/15 0920

0-1 Asphalt, fill

~~0-1-43~~ Uniform dry light brown clay

5-7 - SAA

7-10 - SAA, moist

10-15 - SAA, wet

FID:

2.5-5 0.08

5-7.5 1.5

7.5-10 1.24

10-12.5 1.30

12.5-15 1.37

MC04 3/24/15 1105

0-1 Concrete

1-2 Backfill, base aggregate

2-5 Dry yellowish brown uniform clay

5-6 SAA

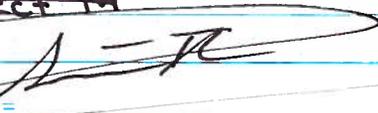
6-10 - SAA, saturated

FID: 2.5-5 : 1.68

5-7.5 : 2.04

7.5-10 : 2.11

⑤ Sample collected

⑤ ~~1125 Collect M~~Scale: 1 square = 

Rite in the Rain

3/24/15 McClung Warehouse S. Thomas

- 1130, Late Note, Summa Carister setup & sample collection begins at MC-SG-06. Removed 3 cubic inches of purged air. Depth set at 10 feet.
- 1250 Sample collection complete at MC-SG-06
- 1255 START and drillers prepares sample location for collection of MC-SG-03 and split. Removed 3 cubic inches of purged air. Depth set at 5.5 feet.
- 1305 Sample collection begins at MC-SG-03 + Split.
- 1315 START and crew break for lunch
- 1405 Return from lunch
- 1415 Drillers begin drilling at MC-SG-04
- 1417 Sample collection complete at MC-SG-03 and Split. Removed 3 cubic inches. Depth set 4.5 feet
- 1446 ~~Crew begins drilling at MC-SG-04~~ Sample collection begins at MC-SG-04. Purged at ~~Removed 3~~ cubic inches of purged air. Depth set at ~~5~~
- 1507 Sample collection ended at MC-SG-04. No activity displayed/Change in reading on regulator.
- 1514 Sample collection begins at MC-SG-05
- 1537 Drillers reset location at MC-SG-04 to 2 feet, Pinches since air canister failed.

Scale: 1 square =

3/24/15 McClung Warehouse S. Thomas

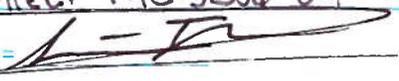
- Location repurged 3 well volumes.
- 1540 New groundwater location for MC-GW-05 drilled at 501 W. Jackson Avenue. START Snyder begins groundwater <sup>Purging</sup> ~~Sampling~~ activities.
- 1549 Deminimis staining observed in the area immediately surrounding new groundwater location MC-GW-05, 501 W. Jackson Avenue.
- 1634 Sample collection complete at MC-SG-05.
- 1705 Groundwater sample collected for MC-GW-05.
- 1725 Groundwater sample collected for MC-GW-05-DUP.
- 1730 START begins packing samples for shipment.
- 1830 Offsite to drop samples at FedEx location. Snyder still on site cleaning up and securing site.
- 1857 Samples dropped off at FedEx. End of day  
Note: Depth to groundwater for GW-05 is 15 feet.

Scale: 1 square =

Rite in the Rain

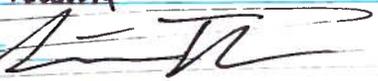
3/25/15 McClung Warehouses S. Thomas

- 0700 START and drillers arrive onsite. Hold H & S meeting
- weather WAF and cool. High today in mid 70s.
- workplan Continue soil boring at concrete foundations. Offset 2 more times at MC-GW-08. Map sampling locations and complete soil collection activities.
- 0720 ~~Start~~ START begins mapping sampling locations to double check Trimble and drilling activities at MC-GW-08.
- 0730 - Refry MC-GW-08 location, offset  $\approx 20'$  south
- 0740 - Refusal (bedrock) @ 16' bgs, set temp well @ 16' bgs.
- 0805 - Gauge well, no water in well.
- 0810 - Offset refry #2  $\approx 40'$  south of original location
- 0820 - Able to push thru refry #2 to refusal @ 27' (bedrock), Temp well set @ 27' bgs. 20' of screen under 10' of riser
- 0905 - Collect MC-SF05-01
- 0935 - Collect MC-SB05-09 from 9-10' bgs
- 0950 - Collect MC-SF06-01
- 1020 - Collect MC-SB06-04

Scale: 1 square = 

3/25/15 McClung Warehouses S. Thomas

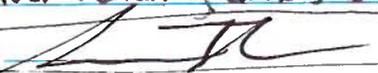
- MC-05 3/25/15 0900
- 0-2 - Brick, concrete, fill
- 2-5 - Red clay mixed w/ brick
- 5-10 - SAA, moist @ 6'
- FID Results
- ~~2.5~~
- 5-7.5 : 0.27
- 7.5-10 : 0.64
- Limited volume on surface sample MC-SF05-01 due to poor recovery
- 
- MC-06 3/25/15 0930
- 0-1 - concrete
- 1-2.5 - Dark brown moist sandy clay, brick fragments
- 2.5-4 - Non-native, dark brown/black silty dry sandy w/ gravel
- 4-10 - Uniform light brown/orange clay moist @ 5.5 ft bgs
- FID Results:
- 2.5-5 : 2.72
- 5-7.5 : -0.34
- 7.5-10 : 0.06
- Limited volume on surface sample MC-SF06-01 due to poor recovery

Scale: 1 square = 

Rite in the Rain

3/25/15 McClung Warehouses S. Thomas

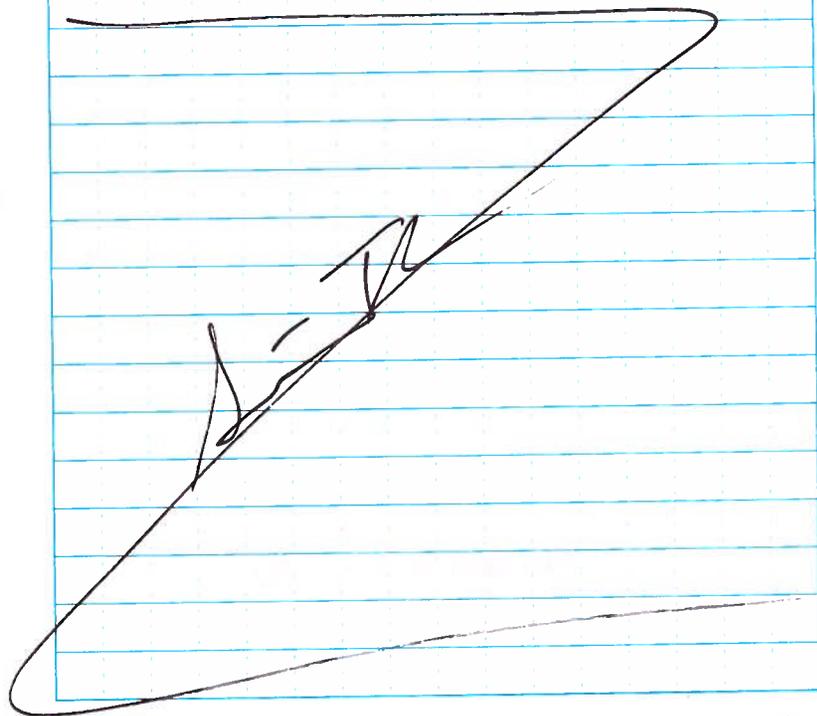
- 1035 START prepares to collect Composite Sample
- 1050 Collect MC-COM-01
- 1135 Collect IDW water MC-IDW<sup>ST</sup> WATER
- 1210 START offsite to deliver air samples to lab. Samples dropped off / COC Complete at 12:28
- 1250 START returns to site to complete 5-point composite sample.  
Note: (1230) Equipment Blank and Field (1210) Blank samples prepared by Snyder, J.
- 1320 START began sample collection for 5-pt composite. VOC collection
- 1330 Collect MC-COM-02 . . . . . spot due to possible collection from storm water.
- 1335 START packs samples and cleans up site.  
Note: MC-COM-01, Collect at 1045
- 1455 START Snyder offsite to return to NC. START Thomas and Shaver collect ~~and~~ remaining coordinates
- 1605 START Thomas and Shaver offsite to drop samples off at FedEx. Site clean and secured.
- 1630 Samples dropped off at FedEx. START Shaver returning coolers to Test America

Scale: 1 square = 

3/25/15 McClung Warehouses S. Thomas

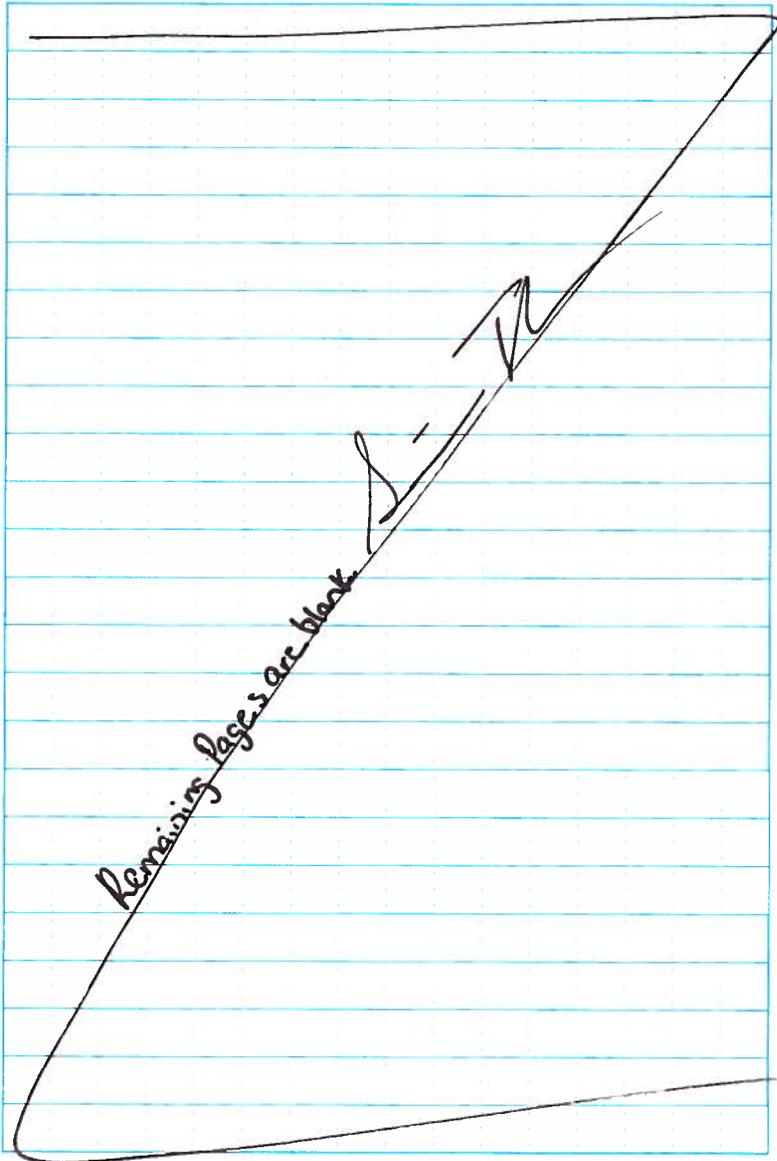
1645 START begins <sup>ST</sup> travel to return to Tetra Tech Duluth, GA.2050 START arrives in Duluth, GA.  
End of day

late Note Due to insufficient water from <sup>ST</sup> MC-CW-08, this location was offset twice. No groundwater developed in the three temporary wells set for MC-CW-08.

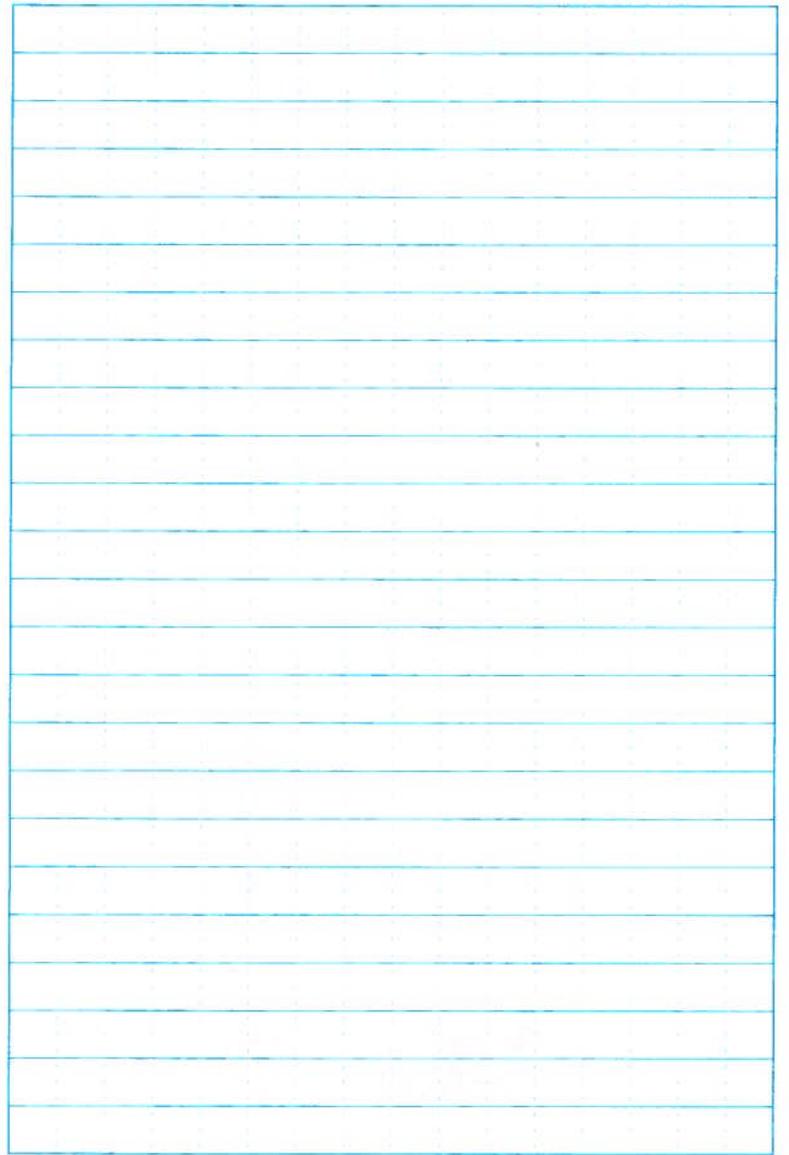


Scale: 1 square = \_\_\_\_\_

Rite in the Rain



Scale: 1 square = \_\_\_\_\_



Scale: 1 square = \_\_\_\_\_

*Write in the Rain*

Sampler Type/Interval	Time	Recovered/Driven (in./in.)	Pocket Penetrometer (tons/ft <sup>2</sup> )	PID Reading (ppm)	Depth (feet) (bgs)	Lithologic Unit	USCS Type/Designation	Soil Description
					0			
					1			<i>Concrete</i>
					2			<u><i>Fill, aggregate</i></u>
					3			<i>Light yellow, homogeneous</i>
					4			<i>dry clay</i>
					5			
					6			
					7			<i>SAA</i>
					8			
					9			
					10			
					11			<u><i>SAA, saturated</i></u>
					12			<i>Light grey, silty dry clay</i>
					13			
					14			<u><i>Light brown saturated</i></u> <i>clay</i>
					15			
					16			<i>1" pvc well set @ 15'</i>
					17			
					18			<i>10' of 0.010' screen with</i>
					19			<i>between 5' riser</i>
					20			
					21			
					22			
					23			
					24			
					25			

PROJECT: *McClung Warehouse*  
 SITE:  
 BORING ID:

MW ID: *MW-08*

DATE: *3/24/15* *0825*  
 LOGGED BY: *dws* Page 1 of 2

Sampler Type/ Interval	Time	Recovered/Driven (in./ft.)	Pocket Penetrometer (tons/ft <sup>2</sup> )	PH-Reading (ppm) <i>PH</i>	Depth (feet bgs)	Lithologic Unit	USCS Type/Designation	Soil Description
					0			<u>Asphalt</u>
					1			
					2			<u>Brown dry sandy clay</u>
				Ø	3			
					4			<u>Smooth, uniform light brown clay</u>
					5			
				Ø	6			
					7			<u>SAA, moist</u>
					8			
				Ø	9			
					10			
					11			<u>Saturated sandy brown clay</u>
					12			
					13			<u>rock / sap.</u>
					14			1' temp well set @ 15' bgs; 10' screen 5' clear
					15			
					16			
					17			
					18			
					19			
					20			
					21			
					22			
					23			
					24			
					25			

*[Handwritten signature]*

## MONITORING WELL/GROUNDWATER SAMPLING SHEET

Monitoring Well No.: GW-085 Date: 3/24/15  
 Project Name: McClung Warehouses Project No.: TT-06-006  
 Sampler: ST  
 Depth to Well Bottom: 14.95 ft Well Volume (gal):  
 Depth to Water: 9.30 ft 1 inch 2-inch well = water column (ft) x 0.163 1" = 0.04  
 Water Column: 5.65 ft 4-inch well = water column (ft) x 0.653  
 Well Diameter: 1" in 6(1/8)-inch well = water column (ft) x 1.53  
 Well Volume: 0.22 gal Immiscible Layer? X

Time	Volume Purged (gal.)	Water Level (ft BTOC)	Temp. (C)	Conduct. (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)
1600	1.5	11.71	17.16	<del>548</del> <sup>548</sup>	2.05	6.83	81.4	1357
1610	3.0	11.42	16.50	519	1.87	6.73	83.8	2135
1620	4.0	10.55	17.91	544	1.78	6.73	84.8	392
1630	4.5	10.42	17.50	537	1.87	6.72	79.4	86.8
1640	5.0	10.43	17.52	537	1.78	6.72	<del>78.7</del> <sup>78.7</sup>	34.3
1650	5.5	10.37	17.70	536	1.65	6.71	76.6	25.8
1700	6.0	10.36	17.61	536	1.55	6.71	72.9	23.5

Purge Time START	1545
Purge Time END	1705
Sample Time	1705 / 1725
Sample Date	3/24/15
Sample Name	MC-GW-05 d

MC-GW-05 - Dup

Total Volume Purged	6.0 gallons
Pump Type	peristaltic
Purged Dry?	NO
Duplicate?	yes / 1725
MS/MSD?	—

## MONITORING WELL/GROUNDWATER SAMPLING SHEET

Monitoring Well No.: GW-01 Date: 3/24/15  
 Project Name: McClung Warehouses Project No.: TT-06-006  
 Sampler: ST  
 Depth to Well Bottom: 14.82 ft Well Volume (gal):  
 Depth to Water: 5.21 ft 2-inch well =  $0.04 \times \text{water column}$  (ft) x 0.163  
 Water Column: 9.61 ft 4-inch well = water column (ft) x 0.653  
 Well Diameter: 1" in 6(1/8)-inch well = water column (ft) x 1.53  
 Well Volume: 0.4 gal Immiscible Layer? ---

Time	Volume Purged (gal.)	Water Level (ft BTOC)	Temp. (C)	Conduct. (mS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)
0805	1 gal	5.40	14.9	.314	21.6	5.48	95.1	119
0815	1.5	5.40	14.72	.315	21.6	5.45	70.2	87.5
0825	2.0	5.42	14.93	.301	18.7	5.37	78.2	72.9
0841	~3.0	5.42	14.96	.297	16.3	5.33	72.0	49.4
0915	~6.5	5.45	15.09	.292	15.6	5.29	76.8	9.39
0920	<del>7</del> 7.5	5.43	15.11	.292	46.4	5.29	82.9	30.6
0945	~8	5.40	15.31	.294	15.8	5.32	105.5	63.5

Purge Time START	0800
Purge Time END	0950
Sample Time	<del>0920</del> 3/24/15 0950
Sample Date	3/24/15
Sample Name	MC-GW-01

Total Volume Purged	8 gallons
Pump Type	peristaltic
Purged Dry?	NO
Duplicate?	
MS/MSD?	yes

FIELD SAMPLE LOG

INSPECTOR NAME Paul Prys

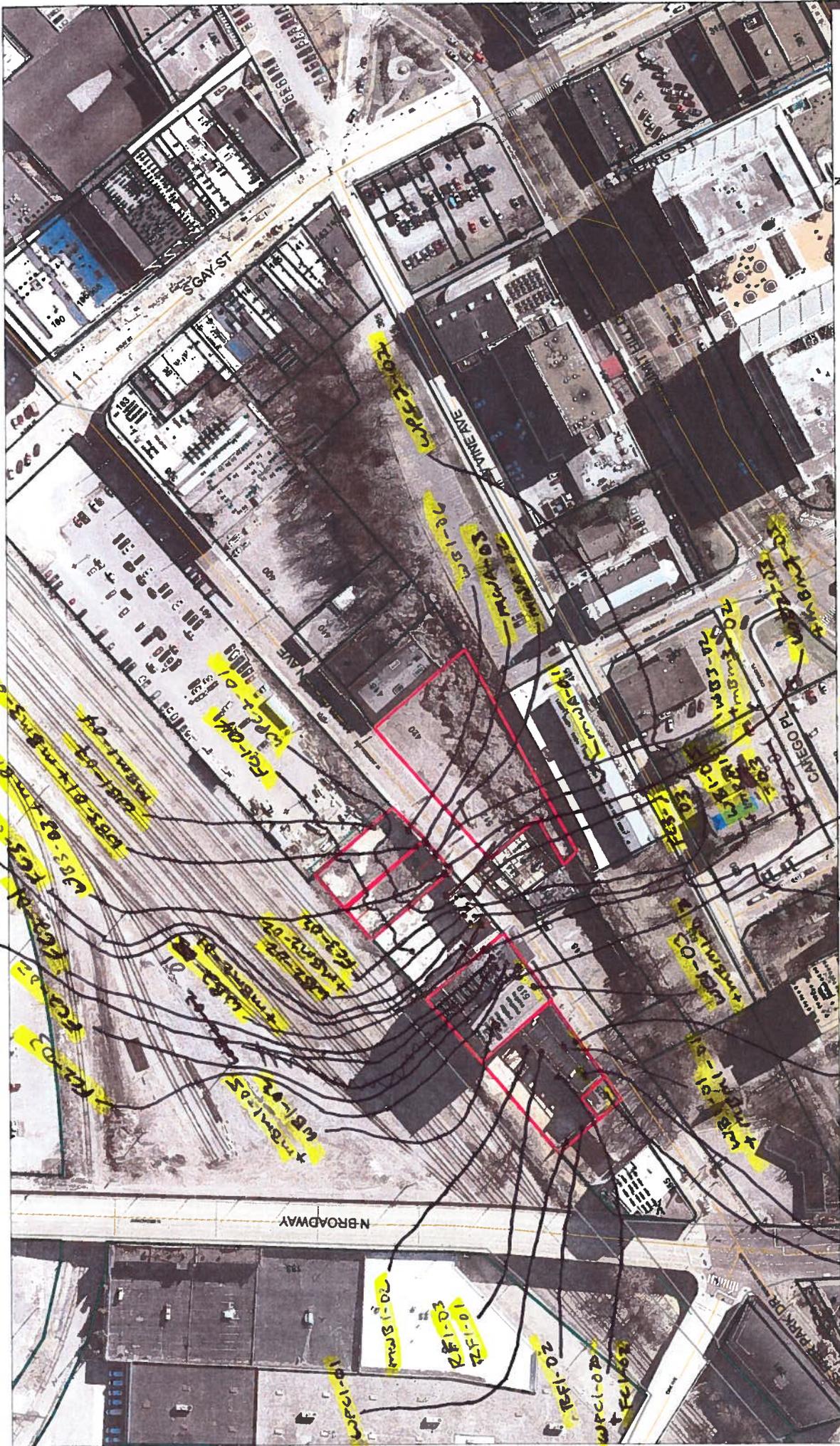
DATE 3/9/15 - 3/11/15

LOCATION McClung Warehouses

Sample Number	Homogeneous Material Description	Friable	Location	Condition
• MC-WB1-01	Brick Wall - RGD		center of 523 - upper level from ground	
• -02			519 - lower level from ground	
• -03			519 - upper level at sidewalk	From wall
• -04			517 - end of SW wall	
• -05			517 - end of NE wall	
• -06			501 - center of S wall by sidewalk	
• -07			501 - at end of NE wall	
• MC-WB2-01	Brick Wall - Dark RGD		509 - center <sup>SW</sup> wall	
• -02			509 - center wall N. end	
• -03			509 - end of NE wall	
• MC-WB3-01	Brick Wall - Black		505 - E. side of S. wall @ sidewalk	
• -02			505 - center of S. wall @ sidewalk	
• -03			505 - W. side of S. wall @ sidewalk	
• MC-MWA-01	Misc. Wall Adhes. v.G. - Black		505 SW corner, upper level @ sidewalk	
• -02			505 center upper level @ sidewalk	
• -03			505 NE corner upper level @ sidewalk	
• MC-MBM1-01	Brick mortar - <del>Dark</del> RGD		center of 523 - upper level from ground	
• -02	Brick		519 - upper level at sidewalk	From wall
• -03			517 - end of NE wall	
• -04			501 - at end of NE wall	
• -05			519 - lower level from ground	
• MC-MBM2-01	Brick mortar - Dark RGD		509 - center SW wall	
• -02	Brick		509 - center wall N. end	
• -03			509 - end of NE wall	







# 2013 Jackson Avenue Proposed Acquisitions

Madeline Rogero, Mayor

FCI-05

FCI-03

FCI-01

FCI-02

FCI-04

FCI-06

FCI-07



CITY OF KNOXVILLE

**APPENDIX D**  
**PHOTOGRAPHIC LOG**  
(13 Pages)



**OFFICIAL PHOTOGRAPH NO. 1**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**TDD Number:** TT-06-006

**Location:** McClung Warehouses

**Orientation:** West-northwest

**Date:** March 23, 2015

**Photographer:** John Snyder, Tetra Tech, Inc.  
(Tetra Tech)

**Witness:** Terrence Hamill, GeoSearches, Inc.

**Subject:** View of geophysical survey being conducted on the portion of the site located at 523 and 525 W. Jackson Avenue in Knoxville, Knox County, Tennessee, the McClung Warehouses site. The ground-penetrating radar (GPR) survey is being conducted before Phase II Environmental Site Assessment (ESA) activities are initiated.



**OFFICIAL PHOTOGRAPH NO. 2**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**TDD Number:** TT-06-006

**Location:** McClung Warehouses

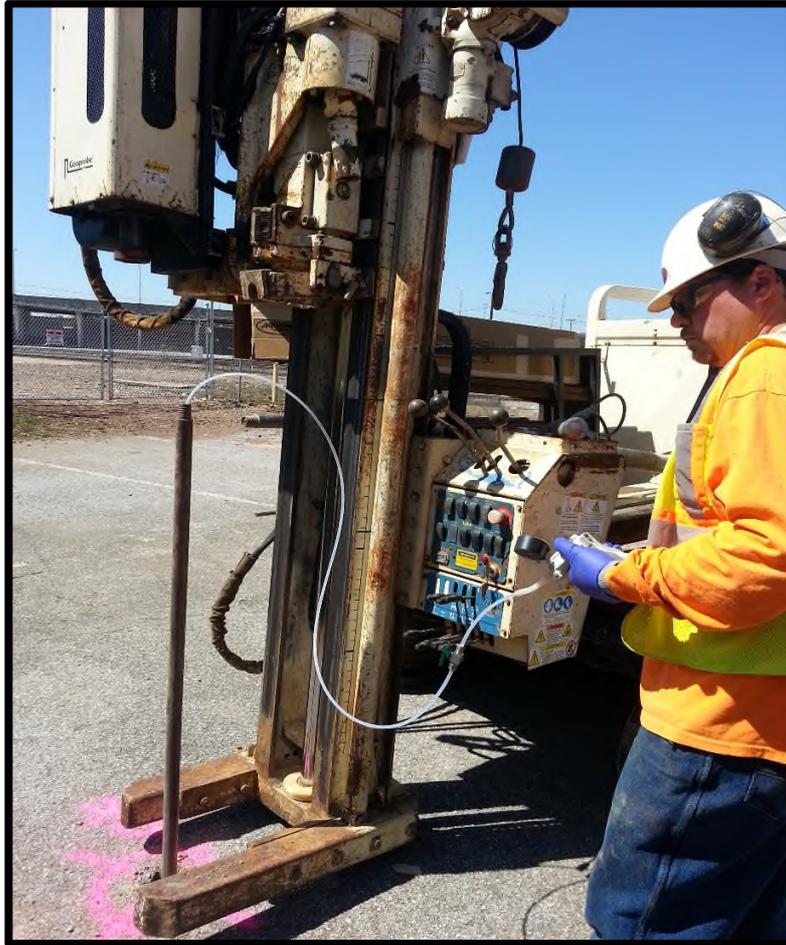
**Orientation:** Northwest

**Date:** March 23, 2015

**Photographer:** Satara Thomas, Tetra Tech

**Witness:** John Snyder, Tetra Tech, and Richard Lane and James Scott, M&W Drilling

**Subject:** View of direct-push technology drilling conducted at soil gas sampling location MC-SG-01.



**OFFICIAL PHOTOGRAPH NO. 3  
U.S. ENVIRONMENTAL PROTECTION AGENCY**

**TDD Number:** TT-06-006

**Location:** McClung Warehouses

**Orientation:** Northwest

**Date:** March 23, 2015

**Photographer:** Satara Thomas, Tetra Tech

**Witness:** Richard Lane and James Scott, M&W Drilling

**Subject:** View of driller purging soil gas line at sampling location MC-SG-02 before samples were collected.







**OFFICIAL PHOTOGRAPH NO. 6**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**TDD Number:** TT-06-006

**Location:** McClung Warehouses

**Orientation:** Northeast

**Date:** March 25, 2015

**Photographer:** Satara Thomas, Tetra Tech

**Witness:** Leslie Shaver, Tetra Tech

**Subject:** View of the 5-point composite area for sampling location MC-COM-02. The 5-point composite area is in the Option Tract of the site, located north of 523 and 525 W. Jackson Avenue.



**OFFICIAL PHOTOGRAPH NO. 7**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**TDD Number:** TT-06-006

**Location:** McClung Warehouses

**Orientation:** Northwest

**Date:** March 24, 2015

**Photographer:** Satara Thomas, Tetra Tech

**Witness:** Leslie Shaver and John Snyder, Tetra Tech

**Subject:** View of stained concrete on the foundation of 501 W. Jackson Avenue. The stain appears to be associated with a minor leak or spill from previous operations. Based on the small size and localized nature of the staining since it is confined to the concrete, it is considered *de minimis*.



**OFFICIAL PHOTOGRAPH NO. 8  
U.S. ENVIRONMENTAL PROTECTION AGENCY**

**TDD Number:** TT-06-006

**Location:** McClung Warehouses

**Orientation:** Not applicable

**Date:** March 9, 2015

**Photographer:** Paul Prys, Tetra Tech

**Witness:** None

**Subject:** Suspect asbestos-containing material (ACM) sample MC-WB1-07, collected from the brick wall at 523 W. Jackson Avenue, located in the center of the upper level from the ground.



**OFFICIAL PHOTOGRAPH NO. 9**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**

<b>TDD Number:</b>	TT-06-006	<b>Location:</b>	McClung Warehouses
<b>Orientation:</b>	Not applicable	<b>Date:</b>	March 9, 2015
<b>Photographer:</b>	Paul Prys, Tetra Tech	<b>Witness:</b>	None
<b>Subject:</b>	Suspect ACM sample MC-MBM1-04, collected from brick mortar at 501 W. Jackson Avenue, located at the end of the northeast wall.		









## **APPENDIX E**

### **LABORATORY DATA PACKAGES**

(12,600 Pages)

(Provided on CD with the Final Phase II ESA Report)

**APPENDIX F**

**TETRA TECH DATA VALIDATION REPORT**

(131 Pages)

(Provided on CD with the Final Phase II ESA Report)

**APPENDIX G**  
**TABLE OF WITNESSES**  
(One Page)

## TABLE OF WITNESSES

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