August 3, 2015

Mr. Bob Rosen  
Brownfields Project Manager  
U.S. Environmental Protection Agency, Region 4  
61 Forsyth Street, SW, 11th 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,

Satara Thomas  
Tetra Tech START IV Project Manager

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
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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 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)

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.
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 bgs. 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 bgs. 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-SF07-01). 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 3,000 mg/kg (MC-SF05-01). 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 (µg/kg), exceeding the EPA RSL of 31 µg/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 (µg/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 µg/m^3 divided by the 0.03 attenuation factor to equal 12 µg/m^3. Benzene concentrations ranged from 18 µg/m^3 (MC-SG-01) to 30 µg/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.
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7.0 REFERENCES


APPENDIX A

FIGURES
(Seven Pages)

FIGURE

1  SITE LOCATION
2  SITE LAYOUT
3  SOIL, SOIL GAS, AND GROUNDWATER SAMPLING LOCATIONS
4  ASBESTOS SAMPLING LOCATIONS
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
- Soil Boring Sample
- Soil Gas Sample
- Soil Boring and Groundwater Samples
- Stain
- Site Location

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.
FIGURE 4A

Asbestos Sampling Locations

TDD Name: McClung Warehouses
TDD No.: TT-06-006
City: Knoxville
County: Knox
State: Tennessee
Date: 6/29/2015
Analyst: Dale V. von Busch
FIGURE 4B
Asbestos Sampling Locations

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

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

Map Source:
Parcel Boundaries, City of Knoxville.
Aerial Imagery, Bing 2012-2013.
FIGURE 4C
Asbestos Sampling Locations

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

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

United States Environmental Protection Agency
Region 4

File: L:\TF-06-006_McClung_Warehouses\mxd\acm_sampling_area_c.mxd
FIGURE 4D
Asbestos Sampling Locations

TDD Name: McClung Warehouses
TDD No.: TT-06-006

United States Environmental Protection Agency
Region 4

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

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

<table>
<thead>
<tr>
<th>Well ID</th>
<th>Sample ID</th>
<th>Depth of Screen Interval</th>
<th>Total Well Depth</th>
<th>Depth to Water</th>
<th>Water Column</th>
<th>Purge Volume</th>
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<td>MC-GW-01</td>
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<td>14.82</td>
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<td>MW-05</td>
<td>MC-GW-05</td>
<td>5 to 15</td>
<td>14.95</td>
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<td>6</td>
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<td>MC-GW-05-DUP</td>
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<td>MW-08</td>
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<td>5 to 15</td>
<td>15</td>
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<td>NA</td>
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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
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<td><strong>Volatile Organic Compounds (µg/kg)</strong></td>
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<td>Methylene Chloride</td>
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<td>140</td>
<td>2.3 U</td>
<td>2.3 U</td>
<td>2.1 U</td>
<td>2.9</td>
<td>2.1 U</td>
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<td>ND</td>
<td>ND</td>
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# Table 2

## McClung Warehouses

### Analytical Results for Surface Soil Samples

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<tr>
<th>Analyte</th>
<th>EPA RSL&lt;sup&gt;1&lt;/sup&gt; Residential Soil</th>
<th>EPA RSL&lt;sup&gt;2&lt;/sup&gt; Industrial Soil</th>
<th>MC-SF05-01</th>
<th>MC-SF06-01</th>
<th>MC-SF07-01</th>
<th>MC-SF08-01</th>
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<td>NL</td>
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<td>29 U</td>
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<td>NA</td>
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<td><strong>Herbicides (µg/kg)</strong></td>
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<sup>1</sup> Maximum Contamination Levels.  
<sup>2</sup> Maximum Contamination Levels.  
<sup>3</sup> Maximum Contamination Levels.  
<sup>4</sup> Maximum Contamination Levels.  
<sup>5</sup> Maximum Contamination Levels.  

**Note:** ND = Not Determined.
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<tr>
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<td>Value listed is for Lead and compounds</td>
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<tr>
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<td>Value listed is for Mercury (elemental)</td>
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<tr>
<td>4</td>
<td>Value listed is for Nickel soluble salts</td>
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<td>U.S. Environmental Protection Agency</td>
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<tr>
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<td>Hazard quotient</td>
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<tr>
<td>J+</td>
<td>The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high</td>
</tr>
<tr>
<td>µg/kg</td>
<td>Micrograms per kilogram</td>
</tr>
<tr>
<td>MC</td>
<td>McClung Warehouses</td>
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<tr>
<td>mg/kg</td>
<td>Milligrams per kilogram</td>
</tr>
<tr>
<td>NA</td>
<td>Not analyzed</td>
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<td>Not detected; the analyte was not detected at or above the reporting limit</td>
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<td>RSL²</td>
<td>Industrial Regional Screening Level, June 2015, HQ = 0.1</td>
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<td>SF</td>
<td>Surface soil</td>
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<tr>
<td>BOLD</td>
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<td>Volatile Organic Compounds (µg/kg)</td>
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</tr>
<tr>
<td>Semivolatile Organic Compounds (µg/kg)</td>
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</tr>
<tr>
<td>Metals (mg/kg)</td>
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<tr>
<td>Arsenic</td>
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<tr>
<td>Barium</td>
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<tr>
<td>Vanadium</td>
<td>39</td>
</tr>
<tr>
<td>Zinc</td>
<td>2,300</td>
</tr>
<tr>
<td>Polychlorinated biphenyls (µg/kg)</td>
<td></td>
</tr>
<tr>
<td>Pesticides (µg/kg)</td>
<td></td>
</tr>
<tr>
<td>Herbicides (µg/kg)</td>
<td></td>
</tr>
</tbody>
</table>

ância: McClung Warehouses

ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES

TT-06-006
McClung Warehouses
Phase II ESA Report
### TABLE 3
**McCLUNG WAREHOUSES**
**ANALYTICAL RESULTS FOR SUBSURFACE SOIL SAMPLES**

<table>
<thead>
<tr>
<th>Analyte</th>
<th>EPA RSL&lt;sup&gt;1&lt;/sup&gt; Residential Soil</th>
<th>EPA RSL&lt;sup&gt;2&lt;/sup&gt; Industrial Soil</th>
<th>MC-SB05-09</th>
<th>MC-SB06-04</th>
<th>MC-SB07-14</th>
<th>MC-SB08-09</th>
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<td>Volatile Organic Compounds (µg/kg)</td>
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<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
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<td>Semivolatile Organic Compounds (µg/kg)</td>
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<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
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<tr>
<td>Metals (mg/kg)</td>
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<td>Aluminum</td>
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<td>19,000</td>
<td>14,000</td>
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<tr>
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<td>3</td>
<td>150</td>
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<td>41</td>
<td>14</td>
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<td>22,000</td>
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<td>140</td>
<td>49</td>
<td>70</td>
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<tr>
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<td>230</td>
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<tr>
<td>ND</td>
<td>Not detected; the analyte was not detected at or above the reporting limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>Not listed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSL(^1)</td>
<td>Residential Regional Screening Level, June 2015, HQ = 0.1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>RSL(^2)</td>
<td>Industrial Regional Screening Level, June 2015, HQ = 0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SB</td>
<td>Subsurface soil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>The analyte was not detected at or above the associated value (reporting limit [RL]).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Shaded values equal or exceed the RSL\(^1\)**

**BOLD** Bold values equal or exceed the RSL\(^2\)**
# TABLE 4

**McCLUNG WAREHOUSES**

**ANALYTICAL RESULTS FOR COMPOSITE SURFACE SOIL SAMPLES**

<table>
<thead>
<tr>
<th>Analyte</th>
<th>EPA RSL¹ Residential Soil</th>
<th>EPA RSL² Industrial Soil</th>
<th>MC-COM-01</th>
<th>MC-COM-01-DUP</th>
<th>MC-COM-02</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volatile Organic Compounds (µg/kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>230,000</td>
<td>3,000,000</td>
<td>7,700</td>
<td>4,900</td>
<td>4,300 UJ</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>NL</td>
<td>NL</td>
<td>5,400</td>
<td>4,400 U</td>
<td>4,300 UJ</td>
</tr>
<tr>
<td>Pyrene</td>
<td>170,000</td>
<td>2,300,000</td>
<td>6,100</td>
<td>4,400 U</td>
<td>4,300 UJ</td>
</tr>
<tr>
<td><strong>Semivolatile Organic Compounds (µg/kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>230,000</td>
<td>3,000,000</td>
<td>7,700</td>
<td>4,900</td>
<td>4,300 UJ</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>NL</td>
<td>NL</td>
<td>5,400</td>
<td>4,400 U</td>
<td>4,300 UJ</td>
</tr>
<tr>
<td>Pyrene</td>
<td>170,000</td>
<td>2,300,000</td>
<td>6,100</td>
<td>4,400 U</td>
<td>4,300 UJ</td>
</tr>
<tr>
<td><strong>Metals (mg/kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum</td>
<td>7,700</td>
<td>110,000</td>
<td>9,500</td>
<td>11,000</td>
<td>7,300</td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.67</td>
<td>3</td>
<td>27</td>
<td>27</td>
<td>45</td>
</tr>
<tr>
<td>Barium</td>
<td>1,500</td>
<td>22,000</td>
<td>210</td>
<td>180</td>
<td>240</td>
</tr>
<tr>
<td>Beryllium</td>
<td>16</td>
<td>230</td>
<td>0.7</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Cadmium</td>
<td>7</td>
<td>98</td>
<td>1.4</td>
<td>1.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Calcium</td>
<td>NL</td>
<td>NL</td>
<td>100,000</td>
<td>110,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Chromium¹</td>
<td>12,000</td>
<td>180,000</td>
<td>24</td>
<td>28</td>
<td>18 J+</td>
</tr>
<tr>
<td>Cobalt</td>
<td>2.3</td>
<td>35</td>
<td>11</td>
<td>12</td>
<td>10 J+</td>
</tr>
<tr>
<td>Copper</td>
<td>310</td>
<td>4,700</td>
<td>83</td>
<td>70</td>
<td>76</td>
</tr>
<tr>
<td>Iron</td>
<td>5,500</td>
<td>82,000</td>
<td>28,000</td>
<td>34,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Lead²</td>
<td>400</td>
<td>800</td>
<td>310</td>
<td>420</td>
<td>300</td>
</tr>
<tr>
<td>Magnesium</td>
<td>NL</td>
<td>NL</td>
<td>4,700</td>
<td>7,200</td>
<td>2,700</td>
</tr>
<tr>
<td>Manganese</td>
<td>180</td>
<td>2,600</td>
<td>740</td>
<td>980</td>
<td>500</td>
</tr>
<tr>
<td>Mercury³</td>
<td>0.94</td>
<td>4</td>
<td>0.29 J</td>
<td>0.53 J</td>
<td>0.19 J-</td>
</tr>
<tr>
<td>Nickel⁴</td>
<td>150</td>
<td>2,200</td>
<td>18</td>
<td>24</td>
<td>21 J-</td>
</tr>
<tr>
<td>Potassium</td>
<td>NL</td>
<td>NL</td>
<td>1,600</td>
<td>1,400</td>
<td>1,500 J+</td>
</tr>
<tr>
<td>Selenium</td>
<td>39</td>
<td>580</td>
<td>2.7</td>
<td>3.2</td>
<td>3</td>
</tr>
<tr>
<td>Silver</td>
<td>39</td>
<td>580</td>
<td>0.13</td>
<td>0.12 U</td>
<td>0.15</td>
</tr>
<tr>
<td>Sodium</td>
<td>NL</td>
<td>NL</td>
<td>92</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>Thallium</td>
<td>0.078</td>
<td>1.2</td>
<td>0.14</td>
<td>0.16</td>
<td>0.39</td>
</tr>
<tr>
<td>Vanadium</td>
<td>39</td>
<td>580</td>
<td>20</td>
<td>24</td>
<td>26 J+</td>
</tr>
<tr>
<td>Zinc</td>
<td>2,300</td>
<td>35,000</td>
<td>540</td>
<td>710</td>
<td>520</td>
</tr>
<tr>
<td><strong>Polychlorinated biphenyls (µg/kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pesticides (µg/kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Herbicides (µg/kg)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# TABLE 4
McCLUNG WAREHOUSES
ANALYTICAL RESULTS FOR COMPOSITE SURFACE SOIL SAMPLES

| Notes: | Value listed is for Chromium III, insoluble salts |
| 1 | Value listed is for Lead and compounds |
| 2 | Value listed is for Mercury (elemental) |
| 3 | Value listed is for Nickel soluble salts |
| 4 | Value listed is for Lead and compounds |

**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^1** Residential Regional Screening Level, June 2015, HQ = 0.1

**RSL^2** 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

<table>
<thead>
<tr>
<th><strong>BOLD</strong></th>
<th>Bold values equal or exceed the RSL^2</th>
</tr>
</thead>
</table>

**Table Values:**

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Chromium III</th>
<th>Lead</th>
<th>Mercury</th>
<th>Nickel</th>
</tr>
</thead>
<tbody>
<tr>
<td>McClung Warehouses</td>
<td>J</td>
<td>J+</td>
<td>J-</td>
<td>J-</td>
</tr>
</tbody>
</table>

**Shaded Values:**

Shaded values equal or exceed the RSL^1
<table>
<thead>
<tr>
<th>Analyte</th>
<th>EPA MCL</th>
<th>MC-GW-01</th>
<th>MC-GW-05</th>
<th>MC-GW-05-DUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatile Organic Compounds (µg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Semivolatile Organic Compounds (µg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Metals (µg/L)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum</td>
<td>NL</td>
<td>310</td>
<td>220</td>
<td>250</td>
</tr>
<tr>
<td>Barium</td>
<td>2,000</td>
<td>33</td>
<td>65</td>
<td>74</td>
</tr>
<tr>
<td>Calcium</td>
<td>NL</td>
<td>37,000</td>
<td>110,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Cobalt</td>
<td>NL</td>
<td>32</td>
<td>0.65</td>
<td>0.72</td>
</tr>
<tr>
<td>Iron</td>
<td>NL</td>
<td>300</td>
<td>250</td>
<td>290</td>
</tr>
<tr>
<td>Magnesium</td>
<td>NL</td>
<td>6,600</td>
<td>6,400</td>
<td>7,100</td>
</tr>
<tr>
<td>Manganese</td>
<td>NL</td>
<td>5,100</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Nickel</td>
<td>NL</td>
<td>5.2</td>
<td>5 U</td>
<td>5 U</td>
</tr>
<tr>
<td>Potassium</td>
<td>NL</td>
<td>4,600</td>
<td>2,600</td>
<td>2,800</td>
</tr>
<tr>
<td>Sodium</td>
<td>NL</td>
<td>15,000</td>
<td>26,000</td>
<td>29,000</td>
</tr>
<tr>
<td>Zinc</td>
<td>NL</td>
<td>26</td>
<td>20 U</td>
<td>20 U</td>
</tr>
<tr>
<td>Polychlorinated biphenyls (µg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Pesticides (µg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Herbicides (µg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
</tbody>
</table>
**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]).
- **BOLD** Bold values indicate values equal or exceed the associated MCL.

### 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]).
- **BOLD** Bold values indicate values equal or exceed the associated MCL.
### TABLE 6
McCLUNG WAREHOUSES
ANALYTICAL RESULTS FOR SOIL GAS SAMPLES

<table>
<thead>
<tr>
<th>Constituent of Potential Concern</th>
<th>2-Butanone (MEK)</th>
<th>Acetone</th>
<th>Benzene</th>
<th>Cyclohexane</th>
<th>Ethylbenzene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Screening Level (RSL) Cancer Screening Level for Residential Air (ug/m³), 10⁻⁶ risk, alpha of 0.03</td>
<td>NA</td>
<td>NA</td>
<td>12</td>
<td>NA</td>
<td>37</td>
</tr>
<tr>
<td>RSL Non Cancer Screening Level for Residential Air (ug/m³), HI = 0.10, alpha of 0.03</td>
<td>17,333</td>
<td>106,667</td>
<td>103</td>
<td>21,000</td>
<td>3,333</td>
</tr>
<tr>
<td>RSL Cancer Screening Level for Industrial Air (ug/m³), 10⁻⁶ risk, alpha of 0.03</td>
<td>NA</td>
<td>NA</td>
<td>53</td>
<td>NA</td>
<td>163</td>
</tr>
<tr>
<td>RSL Non Cancer Screening Level for Industrial Air (ug/m³), HI = 0.10, alpha of 0.03</td>
<td>73,333</td>
<td>466,667</td>
<td>433</td>
<td>86,667</td>
<td>14,667</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Results (ug/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC-SG-01</td>
<td>29 U</td>
</tr>
<tr>
<td>MC-SG-02</td>
<td>47</td>
</tr>
<tr>
<td>MC-SG-03</td>
<td>27 U</td>
</tr>
<tr>
<td>MC-SG-03-SP</td>
<td>28 U</td>
</tr>
<tr>
<td>MC-SG-04</td>
<td>190.00</td>
</tr>
<tr>
<td>MC-SG-05</td>
<td>29 U</td>
</tr>
<tr>
<td>MC-SG-06</td>
<td>27 U</td>
</tr>
</tbody>
</table>
## TABLE 6
**McCLUNG WAREHOUSES**
ANALYTICAL RESULTS FOR SOIL GAS SAMPLES

<table>
<thead>
<tr>
<th>Constituent of Potential Concern</th>
<th>Methylcyclohexane</th>
<th>Naphthalene</th>
<th>Styrene</th>
<th>Toluene</th>
<th>Xylenes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Screening Level (RSL) Cancer Screening Level for Residential Air (ug/m³), 10⁻⁶ risk, alpha of 0.03</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RSL Non Cancer Screening Level for Residential Air (ug/m³), HI = 0.10, alpha of 0.03</td>
<td>NA</td>
<td>NA</td>
<td>3,333</td>
<td>17,333</td>
<td>333</td>
</tr>
<tr>
<td>RSL Cancer Screening Level for Industrial Air (ug/m³), 10⁻⁶ risk, alpha of 0.03</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RSL Non Cancer Screening Level for Industrial Air (ug/m³), HI = 0.10, alpha of 0.03</td>
<td>NA</td>
<td>NA</td>
<td>14,667</td>
<td>73,333</td>
<td>1,467</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Sample Results (ug/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC-SG-01</td>
<td>35 26 U 8.5 U 9.8 17 U</td>
</tr>
<tr>
<td>MC-SG-02</td>
<td>21 25 U 8.1 U 78 17 U</td>
</tr>
<tr>
<td>MC-SG-03</td>
<td>10 24 U 7.7 U 6.9 U 16 U</td>
</tr>
<tr>
<td>MC-SG-03-SP</td>
<td>11 25 U 8.1 U 7.2 U 17 U</td>
</tr>
<tr>
<td>MC-SG-04</td>
<td>16 140 9 49 56</td>
</tr>
<tr>
<td>MC-SG-05</td>
<td>13 26 U 8.5 U 7.5 U 17 U</td>
</tr>
<tr>
<td>MC-SG-06</td>
<td>23 78 7.7 U 27 16 U</td>
</tr>
</tbody>
</table>
### TABLE 6
McCLUNG WAREHOUSES
ANALYTICAL RESULTS FOR SOIL GAS SAMPLES

**Notes:**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>HI</td>
<td>Hazard Index</td>
</tr>
<tr>
<td>MC</td>
<td>McClung Warehouses</td>
</tr>
<tr>
<td>NA</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>RSL</td>
<td>Regional Screening Level, June 2015, HQ = 0.1</td>
</tr>
<tr>
<td>SG</td>
<td>Soil gas</td>
</tr>
<tr>
<td>SP</td>
<td>Split sample</td>
</tr>
<tr>
<td>µg/m³</td>
<td>Micrograms per meter cubed</td>
</tr>
<tr>
<td>U</td>
<td>The analyte was not detected at or above the associated value (reporting limit [RL])</td>
</tr>
</tbody>
</table>

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>
<thead>
<tr>
<th>HA</th>
<th>SAMPLE NUMBER</th>
<th>MATERIAL DESCRIPTION</th>
<th>ASBESTOS DETECTED BY PLM</th>
<th>FRIABLE</th>
<th>NON-ASBESTOS MATERIAL PRESENT</th>
<th>BUILDING</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MC-WB1-01</td>
<td>Brick Wall-Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Center of upper level from ground</td>
</tr>
<tr>
<td></td>
<td>MC-WB1-02</td>
<td>Brick Wall-Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>519</td>
<td>Lower level from ground</td>
</tr>
<tr>
<td></td>
<td>MC-WB1-03</td>
<td>Brick Wall-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>519</td>
<td>Upper level at sidewalk from wall</td>
</tr>
<tr>
<td></td>
<td>MC-WB1-04</td>
<td>Brick Wall-Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>End of southwest wall</td>
</tr>
<tr>
<td></td>
<td>MC-WB1-05</td>
<td>Brick Wall-Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>End of northeast wall</td>
</tr>
<tr>
<td></td>
<td>MC-WB1-06</td>
<td>Brick Wall-Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>501</td>
<td>Center of side wall by sidewalk</td>
</tr>
<tr>
<td></td>
<td>MC-WB1-07</td>
<td>Brick Wall-Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>501</td>
<td>At end of northeast wall</td>
</tr>
<tr>
<td>2</td>
<td>MC-WB2-01</td>
<td>Brick Wall-Dark Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Center southwest wall</td>
</tr>
<tr>
<td></td>
<td>MC-WB2-02</td>
<td>Brick Wall-Dark Red</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Center wall north end</td>
</tr>
<tr>
<td></td>
<td>MC-WB2-03</td>
<td>Brick Wall-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>End of northeast wall</td>
</tr>
<tr>
<td>3</td>
<td>MC-WB3-01</td>
<td>Brick Wall-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>East side of southwest wall at sidewalk</td>
</tr>
<tr>
<td></td>
<td>MC-WB3-02</td>
<td>Brick Wall-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>Center of south wall at sidewalk</td>
</tr>
<tr>
<td></td>
<td>MC-WB3-03</td>
<td>Brick Wall-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>West side of south wall at sidewalk</td>
</tr>
<tr>
<td>4</td>
<td>MC-MWA-01</td>
<td>Miscellaneous-Wall Adhesive-Black</td>
<td>10% Chrysotile</td>
<td>No</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>Southwest corner, upper level at sidewalk</td>
</tr>
<tr>
<td></td>
<td>MC-MWA-02</td>
<td>Miscellaneous-Wall Adhesive-Black</td>
<td>10% Chrysotile</td>
<td>No</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>Center upper level at sidewalk</td>
</tr>
<tr>
<td></td>
<td>MC-MWA-03</td>
<td>Miscellaneous-Wall Adhesive-Black</td>
<td>10% Chrysotile</td>
<td>No</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>Northeast corner upper level at sidewalk</td>
</tr>
<tr>
<td>5</td>
<td>MC-MBM1-01</td>
<td>Brick Mortar-Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Center of upper level from ground</td>
</tr>
<tr>
<td></td>
<td>MC-MBM1-02</td>
<td>Brick Mortar-Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>519</td>
<td>Upper level at sidewalk from wall</td>
</tr>
<tr>
<td></td>
<td>MC-MBM1-03</td>
<td>Brick Mortar-Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>End of northeast wall</td>
</tr>
<tr>
<td></td>
<td>MC-MBM1-04</td>
<td>Brick Mortar-Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>501</td>
<td>At end of northeast wall</td>
</tr>
<tr>
<td></td>
<td>MC-MBM1-05</td>
<td>Brick Mortar-Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>519</td>
<td>Lower level from ground</td>
</tr>
<tr>
<td>6</td>
<td>MC-MBM2-01</td>
<td>Brick Mortar-Dark Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Center southwest wall</td>
</tr>
<tr>
<td></td>
<td>MC-MBM2-02</td>
<td>Brick Mortar-Dark Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Center wall north end</td>
</tr>
<tr>
<td></td>
<td>MC-MBM2-03</td>
<td>Brick Mortar-Dark Red Brick</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>End of northeast wall</td>
</tr>
<tr>
<td>7</td>
<td>MC-MBM3-01</td>
<td>Brick Mortar-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>East side of south wall at sidewalk</td>
</tr>
<tr>
<td></td>
<td>MC-MBM3-02</td>
<td>Brick Mortar-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>Center of south wall at sidewalk</td>
</tr>
<tr>
<td></td>
<td>MC-MBM3-03</td>
<td>Brick Mortar-Black</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>505</td>
<td>West side of south wall at sidewalk</td>
</tr>
<tr>
<td>8</td>
<td>MC-MCM-01</td>
<td>Miscellaneous-Ceiling Mortar</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>From floor of upper southwest room</td>
</tr>
<tr>
<td></td>
<td>MC-MCM-02</td>
<td>Miscellaneous-Ceiling Mortar</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>From floor of upper southwest room</td>
</tr>
<tr>
<td></td>
<td>MC-MCM-03</td>
<td>Miscellaneous-Ceiling Mortar</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>From floor of upper southwest room</td>
</tr>
<tr>
<td>HA</td>
<td>SAMPLE NUMBER</td>
<td>MATERIAL DESCRIPTION</td>
<td>ASBESTOS DETECTED BY PLM</td>
<td>FRIABLE</td>
<td>NON-ASBESTOS MATERIAL PRESENT</td>
<td>BUILDING</td>
<td>LOCATION</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
<td>----------------------</td>
<td>---------------------------</td>
<td>---------</td>
<td>-------------------------------</td>
<td>----------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>9</td>
<td>MC-RF1-01*</td>
<td>Roof Flashing</td>
<td>10% Chrysotile</td>
<td>No</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>East side of center lower level wall</td>
</tr>
<tr>
<td></td>
<td>MC-RF1-02*</td>
<td></td>
<td>7% and 10% Chrysotile</td>
<td>No</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Center of west wall lower level</td>
</tr>
<tr>
<td></td>
<td>MC-RF1-03*</td>
<td></td>
<td>10% Chrysotile</td>
<td>No</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>East side of center lower level wall</td>
</tr>
<tr>
<td>10</td>
<td>MC-MWB1-01</td>
<td>Miscellaneous Wall-Brick-Yellow (Tiger Crown)</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Center west side of center lower level wall</td>
</tr>
<tr>
<td></td>
<td>MC-MWB1-02</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Center east side of northeast debris pile</td>
</tr>
<tr>
<td></td>
<td>MC-MWB1-03</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Center east side of northeast debris pile</td>
</tr>
<tr>
<td>11</td>
<td>MC-WPC1-01</td>
<td>Poured Concrete Wall-Exterior Smooth</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Northeast corner of upper level wall</td>
</tr>
<tr>
<td></td>
<td>MC-WPC1-02</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Center south side of upper level wall</td>
</tr>
<tr>
<td></td>
<td>MC-WPC1-03</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Center column southwest wall</td>
</tr>
<tr>
<td>12</td>
<td>MC-WPC2-01</td>
<td>Poured Concrete Wall-Interior Smooth</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Center column center wall</td>
</tr>
<tr>
<td></td>
<td>MC-WPC2-02</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Center column southwest wall</td>
</tr>
<tr>
<td></td>
<td>MC-WPC2-03</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Center northwest area near railroad tracks</td>
</tr>
<tr>
<td>13</td>
<td>MC-FC1-01</td>
<td>Concrete Floor-Smooth</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>525</td>
<td>Center of east side</td>
</tr>
<tr>
<td></td>
<td>MC-FC1-02</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Center of west side of upper level</td>
</tr>
<tr>
<td></td>
<td>MC-FC1-03</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Center northwest area near railroad tracks</td>
</tr>
<tr>
<td></td>
<td>MC-FC1-04</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Center northwest area near railroad tracks</td>
</tr>
<tr>
<td></td>
<td>MC-FC1-05</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>523</td>
<td>Center west side of upper level</td>
</tr>
<tr>
<td>14</td>
<td>MC-FC2-01</td>
<td>Concrete Floor-Large Rectangular Pattern</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Northeast corner upper level</td>
</tr>
<tr>
<td></td>
<td>MC-FC2-02</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Center upper level</td>
</tr>
<tr>
<td></td>
<td>MC-FC2-03</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>517</td>
<td>Southwest corner upper level</td>
</tr>
<tr>
<td>15</td>
<td>MC-FC3-01*</td>
<td>Concrete Floor-Small Rectangular Pattern</td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Northwest corner upper level</td>
</tr>
<tr>
<td></td>
<td>MC-FC3-02</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Center upper level</td>
</tr>
<tr>
<td></td>
<td>MC-FC3-03</td>
<td></td>
<td>ND</td>
<td>NA</td>
<td>See detailed laboratory sheet in Appendix E</td>
<td>509</td>
<td>Southwest corner upper level</td>
</tr>
</tbody>
</table>
### TABLE 7
McCLUNG WAREHOUSES
ANALYTICAL RESULTS FOR ASBESTOS SAMPLES

<table>
<thead>
<tr>
<th>NOTES</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Multiple layers were analyzed and found to contain asbestos fibers</td>
</tr>
<tr>
<td>%</td>
<td>Percent</td>
</tr>
<tr>
<td>FC</td>
<td>Floor concrete</td>
</tr>
<tr>
<td>HA</td>
<td>Homogeneous area</td>
</tr>
<tr>
<td>MBM</td>
<td>Miscellaneous brick mortar</td>
</tr>
<tr>
<td>MC</td>
<td>McClung Warehouses</td>
</tr>
<tr>
<td>MCM</td>
<td>Miscellaneous ceiling mortar</td>
</tr>
<tr>
<td>MWA</td>
<td>Miscellaneous wall adhesive</td>
</tr>
<tr>
<td>MWB</td>
<td>Miscellaneous wall brick</td>
</tr>
<tr>
<td>NA</td>
<td>Not applicable</td>
</tr>
<tr>
<td>ND</td>
<td>No fibers detected</td>
</tr>
<tr>
<td>PLM</td>
<td>Polarized Light Microscopy</td>
</tr>
<tr>
<td>RF</td>
<td>Roof flashing</td>
</tr>
<tr>
<td>WB</td>
<td>Wall brick</td>
</tr>
<tr>
<td>WPC</td>
<td>Wall poured concrete</td>
</tr>
</tbody>
</table>

Shaded values exceed the definition of ACM found in 40 CFR Part 763.83
### TABLE 8
McCLUNG WAREHOUSES
ANALYTICAL RESULTS FOR IDW SAMPLES

<table>
<thead>
<tr>
<th>Analyte</th>
<th>EPA TCLP Limits</th>
<th>MC-IDW-WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLP Volatile Organic Compounds</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>TCLP Semivolatile Organic Compounds</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>TCLP Herbicide and Pesticide Compounds</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>TCLP Metals (µg/L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barium</td>
<td>100</td>
<td>49</td>
</tr>
</tbody>
</table>

Notes:

1. EPA 40 CFR 261.24 regulatory limits
2. µg/L Micrograms per liter
3. CFR Code of Federal Regulations
4. EPA U.S. Environmental Protection Agency
5. IDW Investigation-derived Waste
6. NA Not applicable
7. ND Not detected at or above the Method Detection Limit
8. TCLP Toxicity Characteristic Leaching Procedure
APPENDIX C
LOGBOOK NOTES AND FIELD SHEETS
(19 Sheets)
McClung Warehouses
103 X 90 2706006
Name: Satara Thomas

Address: 401, 42D, 501, 5DS, 509, 512, 517, 519, 523 525 D. Jackson Avenue, Knoxville, TN
Phone: (618) 458-6838

Project: McClung Warehouses
04:45 START Satara Thomas departs Duluth, GA and travels to Knoxville, TN
0845 Arrive at 400 Main St (Ste W5) to meet with Amarellace Project Manager, Bob Whetzel 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 island behind warehouses that goes under overpasses N. Broadway and Oak Avenue
- 501, 505, 509 - Fire destroyed these in 2001
- 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 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 those parties.

- Sampling needs to include metals, PAHs, herbicides/pesticides
- 512 and 420W. 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, RA shed is gone but a temp storage shed is now present
- 509 W. Jackson was a cabinet maker.
- Operated up until the 2007 fire. His space contained solvents & stains. Owner was Ernie Cross.
- Need to research utilities on site. Bob Whetzel provided contact info for Knoxville Utility Board (KUB).
- Derwin Hargood -594 7534-D; 865-619-8770
- KUB uses a yellow pipeline for gas.
312315  McClung Warehouses S. Thomas
0500  START Thomas arrives at office in Duluth, 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 onsite in Knoxville, TN. Meets with Tremor Hall (Geosource)
      weather clear, calm, 50°F
0705  H&S meeting, Utility clearance
0715  START Snyder marks boring locations for clearance.
0830  Geoscan offsite.
0930  START Thomas and Shaver onsite.

Midis  McClung Warehouses S. Thomas
555 W. Jackson Ave, Southeastern
Class
1020  Meeting adjourned and Anne Wallace and Bob Whetsel will meet st site to conduct site reconnaissance.
1030  Begin site recon with Anne and Bob see Environmental Checklist.
1215  Site visit complete, START Thomas begins travels back to Duluth, GA.
1650  START Thomas arrives back in Duluth, GA. End of day.
3/23/15  McClung Warehouses  S. Thomas

0950  START & begins leak testing Summa Canisters.

1030  M+2 Drilling arrive on site, START crew and M+2 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 drillers break for lunch.

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

1405  Drillers begin purging line 3 well volumes, depth 4.5 feet below sawed surface. Removed 3 cubic inches of purged air, groundwater present. 7 feet.

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

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

1458  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 - 

NO elevated VOC readings on 0-10 ft soil core

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  15:00

0-3 - Gravel
3-5 - Smooth, brown homogenous clay, dry
5-6 -
6-10 - 
10-13 -
13-15 - Smooth, uniform grey clay, saturated

NO elevated readings

Scale: 1 square = ____________
3:23:15 McClung Warehouses 8. Thomas
15 15:15 Set 1 pump well @ MC-01.
15 total depth, 10' screen under 5'
of river. 1" PVC w/ 0.010' slot
15 15:33 Started second sample casiter at MC-S6-01. First casiter failed.
15 15:34 Crew begins drilling through concrete foundation at 517/519 at GW-05. Strong creosote odor detected at drilling.
16 16:05 - Collect MC-SF-05
16 16:10 - Collect MC-SBOS-20 from 20-21' bgs
16 16:10 - Stepped second sample casiter at MC-S6-01. Second casiter failed. Driller explained our tubing/probe tie underground water again tomorrow.
17 17:30 Off site to drop samples at FedEx location. Site secured.
17 17:55 Samples dropped off at FedEx. End of day

Notes: Drill redrilled at MC-GW-05. No groundwater present. Tetra Tech will wait until the evening of 3/24/15 to see if groundwater collects in well. Soil gas locations purified gaseous volumes based on vort tube. And surface samples collected 2 feet below paved surface.

3:23:15 McClung Warehouses 8. Thomas
GW-05 3/18 3/23/15 15:35
0-1 Concrete
1-2 Back fill
2-5 Smooth dry uniform clay, brown (creosote odor)
5-10 Uniform brown clay, swelling, extremely stiff
10-21-
Refill @ 21' bgs

Notes: Continued because the foot

| 5' | Interval contained pavement backfill.
15 15:18 Completed sample collect
15 15:20 Drillers Richard
15 15:20 Lane & James Scott.

Scale: 1 square = ____________
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0700</td>
<td>START crew and drillers arrive on site. Hold HAZ meeting.</td>
</tr>
<tr>
<td>0730</td>
<td>Depth to groundwater at MC-56.01 is 55 feet. Soil gas tubing will be set 5 feet around Street. START boring groundwater sampling at MC-60.01. Snider begins calibrating YSI.</td>
</tr>
<tr>
<td>0757</td>
<td>Survey collector started at MC-56.01.</td>
</tr>
<tr>
<td>0800</td>
<td>Groundwater probe begins at MC-56.01. Groundwater depth is 5 feet. See field sheets.</td>
</tr>
<tr>
<td>0900</td>
<td>Groundwater depth is 5 feet. See field sheets. Good test performed on FID1. Readings within range. Collect MC-SF08-01, No elevated readings.</td>
</tr>
<tr>
<td>0915</td>
<td>Collect MC-SB08-09, No elevated readings.</td>
</tr>
<tr>
<td>1000</td>
<td>Collect MC-SF07-01.</td>
</tr>
<tr>
<td>1015</td>
<td>Collect MC-SB07-14.</td>
</tr>
</tbody>
</table>

*Note: 0913 late note, Sample collection ends at MC-56.01.*

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0930</td>
<td>Sample collected at MC-CW0-01 (w/MSMSID).</td>
</tr>
<tr>
<td>1125</td>
<td>Collect MC-SF04-01.</td>
</tr>
<tr>
<td>1135</td>
<td>Collect MC-SB04-09 from 9-10 yrs.</td>
</tr>
</tbody>
</table>

**Groundwater Geology:**
- **MC-07** 3/24/15 0920
  - 0-1 Asphalt, fill
  - 2-4.5 Uniform dry light brown clay
  - 4-7 - 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

**MC-04** 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

*Sample collected at 12/19/15.*

*Note: This is a sample of the handwriting on the page.*
11:30, Late Note. Summer Carister setup & Sample Collection beginning at MC-SG-05. Removed 3 cubic inches of pumped air. Depth set at 10 feet.

12:00 Sample collection complete at MC-SG-05

12:55 START and drillers prepare sample collection for collection of MC-SG-03 and split. Removed 3 cubic inches of pumped air. Depth set at 5.5 feet.

13:00 Sample collection begins at MC-SG-03 & Split.

13:15 START and crew break for lunch.

14:05 Return from lunch.

14:15 Drillers begin drilling at MC-SG-04

14:17 Sample collection complete at MC-SG-03 and Split. Removed 3 cubic inches. Depth set at 4.5 feet.


15:07 Sample collection ended at MC-SG-07. No activity displayed/changes in reading on regulator.

15:14 Sample collection begins at MC-SG-07

15:31 Drillers reset location at MC-SG-04 to 1 feet. Pinches since air was tapped.
3/25/15

MC Clingmore House 5

S Thomas

0700 START and drillers arrive on-site. Hold.

Hi & S Meeting.

Weather 24F and cool. High today in mid-70s.

Work plan: Continue soil boring at concrete foundations.

Offset = 20' from MC-GW-08.

Map sampling locations and complete soil collection activities.

0740 @ 7:40 a.m. START begins mapping sampling locations to double check Trouble and drilling activities at MC-GW-08.

0730 - Refill MC-GW-08 location, offset = 20' south.

0740 - Refill (bedrock) @ 16' bgs, set temp well @ 16' bgs.

0810 - Offset refill #2 = 40' south of original location.

0820 - Able to push thru refill #2 to refusal @ 27' (bedrock). Temp well set @ 27' bgs. 20' of screen under 10' of river.

0905 - Collect MC-SF05-01.

0935 - Collect MC-SB05-09 from 9-10' bgs.

1040 - Collect MC-SE06-01

6.20 - Collect MC-SB06-02

Scale: 1 square =+

3/25/15

MC Clingmore House 5

S Thomas

MC-05 3/25/15 0900

0-2 - Brick, concrete, fill

2.5 - Red clay mixed with gravel

5-10 - SAA, moist @ 6'

F10 Results:

5.7.5: 0.21

7.5-10: 0.64

Limited volume or surface sample MC-SF05-01

due to poor recovery.

MC-06 3/26/15 0930

0-1 - Concrete

1-2.5 - Oak beam, moist; sandy clay, brick fragments

2.5-4 - Nonactive, oak beam/brick & slightly dry sandy w/ gravel

4-10 - Uniform light brown/orange clay

moist @ 5.5 ft bgs

F10 Results:

2.5-5: 2.72

5-7.5: 0.34

7.5-10: 0.66

Limited volume or surface sample MC-SF06-01

due to poor recovery.

Scale: 1 square = +
3/25/15 McChung Warehouses S. Thomas

10:35 START prepares to collect Composite Sample
10:50 Collect MC- COM-01
11:35 Collect IDW water MC-IDW-01
12:00 START offsite to deliver & samples to lab. Samples dropped off & complete at 12:28
12:50 START returns to site to complete 5-point composite sample.
Note: [legible] Equipment Blank and Read (12:10) Blank samples dropped by Brandon
1:30 START begin sample collection for 5-point composite
1:30 Collect MC-COM-02
1:35 START pack samples and clean site.
Note: [legible] Pack MC-COM-01, Collect at 10:45
1:45 START Snyder offsite to return to NC. START Thomas and Shaver collect 5 remaining coordinates
1:50 START Thomas and Shaver offsite to drop samples off at FedEx Site clean and secured.
2:30 Samples dropped off at FedEx. START Shaver returning cooler to Test America
<table>
<thead>
<tr>
<th>Soil Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
</tr>
<tr>
<td>Fill, aggregate</td>
</tr>
<tr>
<td>Light yellow, homogenous</td>
</tr>
<tr>
<td>dry clay</td>
</tr>
<tr>
<td>SAA</td>
</tr>
<tr>
<td>SAA, saturated</td>
</tr>
<tr>
<td>Light grey, silty dry clay</td>
</tr>
<tr>
<td>Light brown saturated clay</td>
</tr>
<tr>
<td>1&quot; pvc well set @ 15'</td>
</tr>
<tr>
<td>10' of 0.010' screen ate beneath 5' fiber</td>
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<tr>
<td>Sampler Type Interval</td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td></td>
</tr>
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Soil Description
MONITORING WELL/GROUNDWATER SAMPLING SHEET

Monitoring Well No.: GW-085  Date: 1/24/15
Project Name: McClung Warehouses  Project No.: TT-06-006
Sampler: ST

Depth to Well Bottom: 14.95 ft  2-inch well = water column (ft) x 0.163
Depth to Water: 9.30 ft
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 (gal): Immiscible Layer? x

<table>
<thead>
<tr>
<th>Time</th>
<th>Volume Purged (gal.)</th>
<th>Water Level (ft BTOC)</th>
<th>Temp. (C)</th>
<th>Conduct. (mS/cm)</th>
<th>DO (mg/L)</th>
<th>pH</th>
<th>ORP (mV)</th>
<th>Turbidity (NTU)</th>
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</thead>
<tbody>
<tr>
<td>1600</td>
<td>1.5</td>
<td>11.71</td>
<td>17.16</td>
<td>649 mS</td>
<td>2.05</td>
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<td>1610</td>
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<td>1640</td>
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<td>1650</td>
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<td>17.70</td>
<td>536</td>
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<td>1700</td>
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<td>536</td>
<td>1.55</td>
<td>6.71</td>
<td>72.9</td>
<td>23.5</td>
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</tbody>
</table>

Purge Time START: 1545  Total Volume Purged: 6.0 galtons
Purge Time END: 1705  Pump Type: peristaltic
Sample Time: 1705/1725  Purged Dry?: NO
Sample Date: 3/24/15  Duplicate?: yes/1725
Sample Name: MC-GW-05  MS/MSD?
# MONITORING WELL/GROUNDWATER SAMPLING SHEET

Monitoring Well No.: **GW-01**
Project Name: **McClung Warehouses**
Sampler: **ST**
Depth to Well Bottom: 14.62 ft
Depth to Water: 5.21 ft
Water Column: 9.61 ft
Well Diameter: 1.0 in
Well Volume: 0.4 gal

Date: **3/24/15**
Project No.: **TT-06-006**

## Immiscible Layer?

<table>
<thead>
<tr>
<th>Time</th>
<th>Volume Purged (gal.)</th>
<th>Water Level (ft BTOC)</th>
<th>Temp. (°C)</th>
<th>Conduct. (mS/cm)</th>
<th>DO (mg/L)</th>
<th>pH</th>
<th>ORP (mV)</th>
<th>Turbidity (NTU)</th>
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<tr>
<td>0805</td>
<td>1.9</td>
<td>5.40</td>
<td>14.9</td>
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<td>14.92</td>
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<td>87.5</td>
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<td>14.93</td>
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<td>15.8</td>
<td>5.32</td>
<td>105.5</td>
<td>63.5</td>
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**Purge Time START**: 0800
**Purge Time END**: 0950
**Sample Time**: 3/24/15 0950
**Sample Date**: 3/24/15
**Sample Name**: MC-GW-01

**Total Volume Purged**: 8 gallons

Pump Type: Piston
Purged Dry?: **NO**
Duplicate?: **NO**
MS/MSD?: **YES**
<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Homogeneous Material Description</th>
<th>Friable</th>
<th>Location</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>mc-w81-01</td>
<td>Brick Wall - Red</td>
<td></td>
<td>523</td>
<td>Upper Level From Ground</td>
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<td>-02</td>
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<td></td>
<td>519</td>
<td>Lower Level From Ground</td>
</tr>
<tr>
<td>-03</td>
<td></td>
<td></td>
<td>519</td>
<td>Upper Level At Sidewalk Wall</td>
</tr>
<tr>
<td>-04</td>
<td></td>
<td></td>
<td>517</td>
<td>End of SW Wall</td>
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<td>-05</td>
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<td></td>
<td>517</td>
<td>End of NE Wall</td>
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<td>-06</td>
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<td>501</td>
<td>Center of SW Wall By Sidewalk</td>
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<td>-07</td>
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<td>501</td>
<td>At End of NE Wall</td>
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<td>mc-w82-01</td>
<td>Brick Wall - Dark Red</td>
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<td>Center NE Wall</td>
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<td>Center Wall N. End</td>
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<td>mc-w83-01</td>
<td>Brick Wall - Black</td>
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<td>505</td>
<td>E. Side Of SW Wall @ Sidewalk</td>
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<td>-02</td>
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<td>505</td>
<td>Center Of SW Wall @ Sidewalk</td>
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<td></td>
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<td>505</td>
<td>W. Side Of SW Wall @ Sidewalk</td>
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<td>Misc. Wall Adhesive - Black</td>
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<td>505</td>
<td>SW Corner Upper Level @ Sidewalk</td>
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<td>-02</td>
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<td>505</td>
<td>Center Upper Level @ SW @ Sidewalk</td>
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<td>-03</td>
<td></td>
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<td>505</td>
<td>Center Upper Level @ SW @ Sidewalk</td>
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<td>mc-mm1-01</td>
<td>Brick Masonry - Red</td>
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<td>523</td>
<td>Upper Level From Ground</td>
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<td>-02</td>
<td>Brick</td>
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<td>519</td>
<td>Upper Level At Sidewalk Wall</td>
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<td>517</td>
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<td>-05</td>
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<td>519</td>
<td>Lower Level From Ground</td>
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<td>Brick Masonry - Dark Red</td>
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<td>Brick</td>
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<td>Center Wall N. End</td>
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<td>-03</td>
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<td>Sample Number</td>
<td>Homogeneous Material Description</td>
<td>Friable</td>
<td>Location</td>
<td>Condition</td>
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<td>mc-membr-21</td>
<td>Brick Mortar - Black</td>
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<td>505 - 5E 5E of S. Wall E Side Wall</td>
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<td>03</td>
<td>505 - 5A 5E of S. Wall E Side Wall</td>
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<td>mc-membr-01</td>
<td>Misc. Ceiling Mortar</td>
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<td>507 - 5A 5E of upper swa 21n</td>
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<td>mc-refl-01</td>
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<td>02</td>
<td>523 - 5E 5E of cont 5er lower 5all</td>
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<td>03</td>
<td>523 - 5E 5E of cont 5er lower 5all</td>
<td>Level 1</td>
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<td>mc-refl-01</td>
<td>Roofing Material Debris</td>
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<tr>
<td>mc-wb1-01</td>
<td>Misc. Wall Brick - Yellow</td>
<td>02</td>
<td>509 - 5A 5E of west debris pile</td>
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<td></td>
<td>(Tiger Fawn)</td>
<td>03</td>
<td>509 - 5A 5E of west debris pile</td>
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<td>Intense Smooth</td>
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<td>517 - 5A 5E of column 5er 5all</td>
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<td>Sample Number</td>
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<td>Friable</td>
<td>Location</td>
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<td>mc-FC1-01</td>
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<td>523 Cntnr of S. Corr Lower Level</td>
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<td>509 SE Corner Upper Level</td>
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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
Orientation: Northwest
Date: March 23, 2015
Location: McClung Warehouses
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. 4
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:   TT-06-006                     Location:   McClung Warehouses
Orientation:  North                          Date:      March 23, 2015
Photographer: Leslie Shaver, Tetra Tech     Witness:  None
Subject:      View of soil gas canister at sampling location MS-SG-06.
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<th>TT-06-006</th>
<th>Location:</th>
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<tr>
<td>Orientation:</td>
<td>Not applicable</td>
<td>Date:</td>
<td>March 25, 2015</td>
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<tr>
<td>Photographer:</td>
<td>Satara Thomas, Tetra Tech</td>
<td>Witness:</td>
<td>John Snyder, Tetra Tech</td>
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<tr>
<td>Subject:</td>
<td>View of soil core when the drill met refusal at sampling location MC-GW-08. This soil core is an offset to the original sampling location of MC-GW-08. No monitoring well was installed at sampling location MC08 because the drill met refusal.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.
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

TDD Number: TT-06-006  Location: McClung Warehouses
Orientation: Not applicable  Date: March 9, 2015
Photographer: Paul Prys, Tetra Tech  Witness: None
Subject: Suspect ACM sample MC-MBM1-04, collected from brick mortar at 501 W. Jackson Avenue, located at the end of the northeast wall.
TDD Number: TT-06-006
Location: McClung Warehouses
Orientation: Not applicable
Date: March 9, 2015
Photographer: Paul Prys, Tetra Tech
Witness: None
Subject: Suspect ACM sample MC-MCM-01, collected from miscellaneous ceiling mortar at 509 W. Jackson Avenue, located at the floor of the upper southwest room.
OFFICIAL PHOTOGRAPH NO. 11
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 ACM sample MC-WB2-01, collected from the brick wall at 509 W. Jackson Avenue, located at the center southwest wall.
<table>
<thead>
<tr>
<th>TDD Number:</th>
<th>TT-06-006</th>
<th>Location:</th>
<th>McClung Warehouses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation:</td>
<td>Not applicable</td>
<td>Date:</td>
<td>March 11, 2015</td>
</tr>
<tr>
<td>Photographer:</td>
<td>Paul Prys, Tetra Tech</td>
<td>Witness:</td>
<td>None</td>
</tr>
<tr>
<td>Subject:</td>
<td>Suspect ACM sample MC-FC1-02, collected from concrete floor at 523 W. Jackson Avenue, located at the center of the south end low brick level.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
OFFICIAL PHOTOGRAPH NO. 13
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TT-06-006
Location: McClung Warehouses
Orientation: Not applicable
Date: March 11, 2015
Photographer: Paul Prys, Tetra Tech
Witness: None
Subject: Suspect ACM sample MC-WPC1-02, collected from poured concrete wall-exterior, smooth, at 523 W. Jackson Avenue, located at center of the south lower-level wall.
APPENDIX E

LABORATORY DATA PACKAGES

(12,600 Pages)

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