

**QUALITY ASSURANCE PROJECT PLAN
NON-INDUSTRIAL USE PROPERTY SAMPLING EVENT**

**35th AVENUE REMOVAL SITE
BIRMINGHAM, JEFFERSON COUNTY, ALABAMA**

Revision 2

Prepared for:



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

Prepared by:



**Oneida Total Integrated Enterprises
1220 Kennestone Circle, Suite 106
Marietta, Georgia 30066**

Contract No.	:	EP-S4-15-01
Task Order No.	:	0002/OT-02-002
Date Submitted	:	February 24, 2016
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QUALITY ASSURANCE PROJECT PLAN
U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)
REGION 4 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM (START)
ONEIDA TOTAL INTEGRATED ENTERPRISES (OTIE) – CONTRACT EP-S4-15-01

SECTION A: Project Planning Elements			
A1. Title (Project Name):		35 th Avenue Removal Site	
Project Location:		<p>The site encompasses three residential neighborhoods: Fairmont, Collegeville, and Harriman Park (FCH); and the 34th Street North Ditch in Birmingham, Jefferson County Alabama (Figures 1 and 2, Appendix A). The geographic coordinates for an approximate center point of the site are 33.561625 North latitude and - 86.802568 West longitude. The Fairmont neighborhood comprises the western portion of the site, Collegeville the southern portion, and Harriman Park the eastern portion. The 34th Street North Ditch lies predominately within the Harriman Park neighborhood.</p>	
Location Description:		<p>This investigation will focus on approximately 1,200 FCH residential and residential-use properties located within the following boundaries: south of 49th Street, east of 26th Street/Highway 31, north of 27th Avenue, and west of the railroad lines (Figure 2, Appendix A). Residential-use properties include childcare facilities; church playgrounds; City Parks and playgrounds; and schools. This investigation will also include sampling in and along the banks of 34th Street North Ditch.</p> <p>The site lies within the Birmingham Valley District of the Alabama Valley and Ridge Physiographic section. The Birmingham Valley is bounded by Sands Mountain to the northwest and Red Mountain to the southeast. Elevations at the site range from approximately 650 feet above mean sea level (amsl) in the Fairmont neighborhood to 560 feet amsl in Harriman Park. Natural drainage trends south-southeast. According to the Federal Emergency Management Agency (FEMA), a large portion of the Collegeville neighborhood is located in a 100-year flood plain (Flood Plain Panel 01073C) (Figure 2, Appendix A).</p> <p>Several railroad lines including L&N (Louisville and Nashville) Railroad, Southern Railroad, and Belt Railroad are located throughout the site.</p>	
Originating Organization:		OTIE, 1220 Kennestone Circle, Suite 106, Marietta, Georgia (GA)	
Document Version/Date:		Revision 2 / February 13, 2013 Discontinuation of Sieving	
<i>Approvals</i>			
Approved By:	Russell Henderson	Date:	Signature:
Title	OTIE Project Manager	2/24/16	
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Approved By: Title	Greg Kowalski OTIE START III Program Manager	Date: 2/24/16	Signature: 
Approved By: Title	Rick Jardine / Subash Patel USEPA On Scene Coordinator (OSC)	Date: 01 MAR 16	Signature: 
A2. Table of Contents	See Page i		
A3. Distribution List	Katrina Jones	USEPA Region 4 Contract Manager	
	Rick Jardine	USEPA Region 4 OSC	
	Subash Patel	USEPA Region 4 OSC	
	OTIE Files	OTIE, Marietta, GA	

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A4. Project/Task Organization

Project Personnel

Organization

Responsibilities

See attached organizational chart

A5. Project Definition and Background

The purpose of this removal investigation is to conduct sampling and analysis activities at the site to identify the nature and extent of contamination in the surface soils and, if present, ditch sediments and surface waters, of residential and residential-use properties. The investigation will also include sampling and analysis of sediments in and along the banks of 34th Street North Ditch. The study area is surrounded by industrial facilities historically and currently associated with coke and chemical manufacturing. Several of these manufacturing facilities have been operational in the since the early 1900s.

Residential dwellings in the Collegeville neighborhood and the Hudson School were present as late as 1929 based on a review of a Sanborn Fire Insurance Map for the same year (1929, V. 9, Sheets 953 and 954). The Harriman Park neighborhood was constructed in the early 1950's based on a review of the 1951 aerial photograph of North Birmingham (CPM 6H-25). Construction of residential dwellings in the Fairmont neighborhood appear to have begun as late as 1951 and continued through the late 1970's.

Sediments collected in 2008 from the surface drainage pathway from the Walter Coke property to the 34th Street North Ditch as part of the Walter Coke Phase III RCRA Facility Investigation (RFI) indicated the presence of elevated concentrations of polycyclic aromatic hydrocarbons (PAH) and metals.

Surface soil samples (0-6 inches below ground surface) collected by Walter Coke, Inc. in 2009 at residential/residential-use properties located within the site boundary indicated elevated levels of carcinogenic polycyclic aromatic hydrocarbons (cPAH) and arsenic. Sixty-five (65) residential properties, a Public Housing, a right-of-way, an off-site Walter Coke property, and four schools (the former Carver High School, the former Hudson School, Riggins Alternative School, and the Calloway Head Start School) were assessed in 2009 as part of a voluntary cooperation effort between the EPA and Walter Coke, Inc. Results indicated that surface soils at portions of 23 of the properties exhibited benzo(a)pyrene toxicity equivalence (BaP TEQ) values exceeding 1.5 milligrams per kilogram (mg/kg) and/or sieved arsenic values exceeding 37 mg/kg. At 16 of the 23 properties, Walter Coke excavated the soils and replaced those soils with clean fill.

A6. Project Description:

START will primarily collect surface soils and sediments to assess whether polycyclic aromatic hydrocarbons (PAHs) and Resource Conservation and Recovery Act (RCRA) 8 metals are present at concentrations above the EPA Removal Management Levels (RMLs). A BaP TEQ will also be calculated from the concentrations detected in the seven carcinogenic PAH compounds.

All samples collected will be submitted to a National Environmental Laboratory Accreditation Conference (NELAC) certified laboratory for Target Compound List (TCL) PAH analysis. Analysis for TCL SVOC will be performed on a subset of the samples collected to ensure that no other compounds of concern are present at the site. Samples collected near former or currently operational substations will also be submitted to a laboratory for polychlorinated biphenyl (PCB) Aroclor and Congener analysis.

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Soil and sediment samples will be field screened ex situ for RCRA metals using an X-Ray Fluorescence (XRF) instrument to efficiently identify properties where potentially elevated levels of inorganic contaminants of concern may be present. A subset of the field screened samples will be submitted to a NELAC laboratory for RCRA metals analysis for confirmation purposes.

The analytical data gathered during this field investigation will provide EPA with sufficient information to identify the need for removal of individual properties within the study boundary.

Sampling shall be conducted in the 34th Street North Ditch and at properties where written access has been granted by the property owner. Based on the approximate 1,200 residential and residential-use properties located within the site boundary, START anticipates collecting 2,400 composite surface soil samples throughout this project. Sediment and surface water samples will also be collected from any surface water drainage pathways located on individual properties and from the banks along the 34th Street North Ditch. Additional quality assurance/quality control (QAQC) samples including field duplicates; rinsate blanks, field blanks, and preservative blanks will also be collected.

Samples will be submitted to TestAmerica Laboratories (TestAmerica), Savannah, Georgia for low-level PAH, RCRA 8 metals, PCB Aroclor, and/or TCL SVOC. Samples, if selected for PCB Congener analysis, will be submitted to a laboratory yet to be determined.

Table 1 summarizes the analysis to be performed during this investigation.

Applicable regulatory information, actions levels, etc.	Removal Management Level (RML) for residential soil (see Tables 2 to 4)
Field Study Date:	February 2013 – June 2013
Projected Lab Completion Date:	10 calendar days from the date of sample receipt at the laboratory to submittal of a Staged Electronic Data Deliverable (SEDD) formatted Electronic Data Deliverable (EDD) and summary of results; 14 calendar days from the date of sample receipt at the laboratory to submittal of a Level IV analytical data package.
Final Report Completion Date:	Final, validated analytical result tables will be prepared and provided to the OSC two weeks following receipt of the final, Level IV data package from the laboratory.

A7. Quality Objectives and Criteria

<i>Problem Statement</i>	Elevated concentrations of hazardous constituents associated with former coke and chemical manufacturing operations have been identified in the surface soils of residential properties and the sediments in surface drainage pathways leading to the 34th Street North Ditch located at the site. There are approximately 1,200 residential and residential-use parcels located within the site boundary that have not been assessed.
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<p><i>Identify the Decisions</i></p>	<p>Based on previous investigations conducted at the site, and former and current manufacturing operations in the surrounding area, evidence suggests that residential surface soils may be contaminated with PAHs and/or metals. This Removal Investigation will focus on determining the extent of contamination in the surface soil at residential and residential-use properties not previously assessed at the site and the sediments in and along the banks of the 34th Street North Ditch.</p> <p>Therefore, the following primary decisions have been identified:</p> <p>(1) Are contaminants of concern present on residential properties in the surface soil, sediment and/or surface water in distinct drainage pathways located on residential properties, or the sediment in the 34th Street North Ditch?</p> <p>(2) Do the concentrations of the detected contaminants exceed RML values?</p> <p>(3) Do the concentrations of the detected contaminants pose an unacceptable risk to human health and/or the environment?</p>
<p><i>Decision Inputs</i></p>	<p>The primary input needed to support the decision making process is the reported analytical concentrations of contamination in samples collected. Field screening of sediments/soils will be used to efficiently assess for metals contamination.</p> <p>Analytical results used in the decision-making process will come from TestAmerica. Reporting limits for target analytes are provided in Tables 2 to 4.</p> <p>The primary inputs needed to support the decision-making process are:</p> <ul style="list-style-type: none"> • Contaminant levels in surface soil, sediment, and surface water samples collected from the residential properties and the 34th Street North Ditch; and, • Background surface soil, sediment, and surface water sample results acquired by EPA in 2010. <p>Results used in the decision-making process will come from the following:</p> <ul style="list-style-type: none"> • RCRA 8 metals field screening of soil and sediment samples using a portable XRF instrument; and/or • TCL PAH, TCL SVOC, RCRA 8 metals, PCB Aroclor, and PCB Congener laboratory analysis.
<p><i>Study Boundary</i></p>	<p>The site boundary is shown in Figure 2.</p>

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<i>Decision Rule</i>	<ul style="list-style-type: none"> • All samples collected will be submitted to a laboratory for low-level TCL PAH analysis. • Surface soil and sediment samples will be field screened ex situ for RCRA 8 metals using an XRF. • All of the surface water and 10 % of the field screened soil/sediment samples will be submitted to a laboratory for RCRA 8 metals analysis. Residential soil samples will be selected based on EPA Memorandum “<i>Recommendations for Use of XRF and Sieving of Soils; 35th Avenue Superfund Site</i>” (February 12, 2013): <ul style="list-style-type: none"> ○ Lead XRF readings between 200 and 600 ppm. ○ Arsenic XRF readings greater than 40 mg/kg with lead XRF readings less than 600 mg/kg. • All of the surface water and sediment samples and 10% of the residential soil samples will be submitted to a laboratory for TCL SVOC analysis. Residential soil samples will be selected using quasi-random sampling, as described in the “Guidance on Choosing a Sample Design for Environmental Data Collection,” EPA/240/R-02/005. • Soil samples collected near transformers will be submitted to a laboratory for PCB Aroclor and/or PCB Congener analysis
<i>Error Limits</i>	<p>This sampling effort is designed to sample in a study area of suspected contamination based on evidence gathered during previous investigations. However, random and systematic errors could be introduced during sample collection, sample handling and storage, sample analysis and data reduction. The QC measures set forth in this QAPP and the specific analytical methods will serve to minimize these errors. QC samples will be used to monitor the accuracy and precision of the sampling activity as well as the analytical process.</p>
<i>Optimize Sampling Design</i>	<p>The data collection activities will focus on identifying the presence or absence of contamination in the study area. Section B will describe sampling design in detail.</p>
A8. Special Training/Certifications	
<p>Individuals implementing this QAPP must receive, at a minimum, orientation to the project’s purpose, scope, and methods of implementation. This orientation is the responsibility of the Project Manager or designee.</p> <p>Any field team members involved with sample collection or handling will have received 40-hour hazardous waste operations and emergency response (HAZWOPER – 29 CFR 1910.120) training.</p> <p>The Health and Safety Officer will have received 8-hour supervisor training course (HAZWOPER – 29 CFR 1910.120). Any other safety-related training is defined in the project HASP.</p> <p>The laboratories performing the analysis for this project will be certified under the NELAC in the State of Alabama. The laboratory managers are responsible for ensuring that personnel training are current and documented as defined in the laboratory’s SOPs. It is the laboratory’s manager’s responsibility to determine specific training and certification needs, and for ensuring that any required training is documented.</p>	

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A9. Documents and Records

Field records that may be generated include the following:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Chains-of-Custody Forms | <input type="checkbox"/> Field Instrument Calibration Logs |
| <input checked="" type="checkbox"/> Field Monitoring and Screening Results | <input type="checkbox"/> Soil Borings and Well Logs |
| <input checked="" type="checkbox"/> Site Maps and Drawings | <input checked="" type="checkbox"/> Health and Safety Plan |
| <input checked="" type="checkbox"/> Photographic Log | <input checked="" type="checkbox"/> Site Logbook |
| <input type="checkbox"/> Waste Manifests | <input checked="" type="checkbox"/> Access Agreements |

Field documentation and records will be generated and maintained in accordance with the requirements presented in the following EPA Region 4 SEDS Field Branches Quality System and Technical Procedures: Control of Records (SESDPROC-002-R5), September 2010; Sample and Evidence Management (SESDPROC-005-R1), November 2007; and Logbooks (SESDPROC-010-R4), October 2010. These documents can be found at the following web address: <http://www.epa.gov/region4/sesd/fbqstp/index.html>.

START will retain all file information related to the site in the Marietta, Georgia, OTIE office. Upon EPA request, the entire site file, including all documents generated under the work assignment, will be inventoried and submitted to EPA or to an EPA-designated location within three weeks of the request. In addition, START will provide digital copies of all documents generated under the work assignment, including reports, e-mails, and figures if requested by EPA. All documents generated for the work assignment are the property of EPA and will be retained as part of EPA files. All EPA files will be delivered to EPA at the conclusion of the START contract.

START will use the information collected at the site to complete a Removal Investigation Report, which summarizes the existing conditions at the site, the field investigation activities, and the nature and extent of contamination within the study area. Environmental and QA/QC analytical data will be evaluated and data tables will be attached to the report. Significant QA/QC issues regarding sample collection, handling, and analysis will be identified in the report.

A draft version of the report will be available for review and commenting by EPA within six weeks following the completion of the site investigation. A final version of the report will be available within two weeks following receipt of comments by EPA. Laboratory data will be released to the EPA OSC as validated data two weeks following receipt of the final results from the laboratory. Table 6 lists the schedule for the deliverables and investigation.

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SECTION B: Data Generation and Acquisition

B1. Sampling Design

START has developed a sampling design to ensure that DQOs are fulfilled for the sampling investigation. Specifically, the design takes into account data needs, key decisions, and environmental variables, such as physical and site constraints, and how the spatial and temporal boundaries of the contamination and population at risk will be identified. The sampling design presented in the following sections has been developed based on information obtained from historical investigations performed at residential properties within the site boundary.

The total number of 5-point composite surface soil samples (0-4 inches below ground surface) to be collected from each residential property will be based on the lot size as follows:

- For residential properties with a total parcel lot size equal to or less than (\leq) 5,000 square feet - the front yard and back yards of each property. If the property has a substantial side yard (primarily corner lots), then one composite soil sample may also be collected from the side yard. Aliquots will be collected away from influences with drip lines and burn areas in a five dice configuration (each of the four corners and the center).
- For residential properties with a total parcel lot size greater than ($>$) 5,000 square feet and \leq ¼-acre - the property should be divided into two roughly equal surface areas. If the property has a substantial side yard (primarily corner lots), then one composite soil sample may be collected from the side yard with the remainder of the property being divided into two roughly equal surface areas. Aliquots will be collected away from influences including drip lines and burn areas with reasonably equal spacing between aliquots.
- Residential properties over ¼-acre in parcel lot size will be divided into ¼-acre sections. When dividing any such property with a substantial side yard (primarily corner lots), one composite soil sample may be collected from the side yard. Aliquots will be collected away from influences including drip lines and burn areas in a five dice configuration, if possible, with reasonably equal spacing between aliquots.

Grab surface soil samples will be collected from apparent exposure pathways where active play sets are located.

Three-point composite surface soil samples will be collected from distinct vegetable gardens from each residential property.

Samples shall not be collected under paved areas or under stationary fixed structures.

Grab sediment and surface water samples will be collected from any surface water drainage pathways located on individual properties, as directed by the OSC.

Grab sediment samples will be collected in and along the banks of the 34th Street North Ditch at locations to be determined in the field.

START anticipates collecting approximately 2,400 soil samples from residential and residential-use properties where access is granted by the property owner during this investigation. Sediment and/or surface water samples will be collected from any drainage pathways found on each property and from the banks of the 34th Street North Ditch. Additional quality assurance/quality control (QAQC) samples including field duplicates; rinsate blanks, field blanks, and preservative blanks will also be collected. All samples will be submitted to TestAmerica for low-level PAH by SW846-8270D. Ten percent (10%) of the soil samples and all surface water/sediment samples will also be analyzed for TCL SVOC by SW846-8270D. All soil and sediment samples will be field screened for RCRA 8 metals using the XRF and 10% of those will be submitted to the laboratory for RCRA 8 metals by SW846-6010C/7470. In addition, any soil samples collected near transformers will be submitted for PCB Aroclor analysis by SW846-8082 and/or PCB Congener analysis by EPA Method 1668A.

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Tables 1 provided summarize the samples to be collected during this investigation and the analysis to be performed.

B2. Sampling Methods, General Procedures

Sampling will be conducted in accordance with the following SESD FBSQTP:

- | | |
|--|--|
| <input type="checkbox"/> Ambient Air Sampling
(SESDPROC-303-R4) | <input type="checkbox"/> Benthic Macroinvertebrate Sorting and Taxonomic
Identification (SESDPROC-509-R1) |
| <input type="checkbox"/> Dye Tracer Measurements
(SESDPROC-504-R0) | <input type="checkbox"/> Fish Field Sampling
(SESDPROC-512-R3) |
| <input type="checkbox"/> Fluvial Sediment Sampling
(SESDPROC-500-R2) | <input type="checkbox"/> Groundwater Sampling
(SESDPROC-301-R2) |
| <input type="checkbox"/> Hydrologic Studies
(SESDPROC-501-R2) | <input type="checkbox"/> Marine Macroinvertebrates
(SESDPROC-511-R2) |
| <input type="checkbox"/> Multi-Habitat Macroinvertebrate Sampling
(SESDPROC-508-R2) | <input type="checkbox"/> Porewater Sampling
(SESDPROC-513-R0) |
| <input type="checkbox"/> Potable Water Supply Sampling
(SESDPROC-305-R1) | <input type="checkbox"/> Pump Operation
(SESDPROC-203-R2) |
| <input type="checkbox"/> Reaeration Measurement By Diffusion Dome
(SESDPROC-505-R2) | <input type="checkbox"/> Reaeration Measurement Using Krypton Gas
(SESDPROC-506-R2) |
| <input type="checkbox"/> Sediment Oxygen Demand
(SESDPROC-507-R2) | <input checked="" type="checkbox"/> Sediment Sampling
(SESDPROC-200-R2) |
| <input type="checkbox"/> Soil Gas Sampling
(SESDPROC-307-R2) | <input checked="" type="checkbox"/> Soil Sampling
(SESDPROC-300-R2) |
| <input checked="" type="checkbox"/> Surface Water Sampling
(SESDPROC-201-R1) | <input type="checkbox"/> Total Community Metabolism
(SESDPROC-503-R2) |
| <input type="checkbox"/> Trace Contaminant Sampling
(SESDPROC-502-R2) | <input type="checkbox"/> Waste Sampling
(SESDPROC-302-R1) |
| <input type="checkbox"/> Wastewater Sampling
(SESDPROC-306-R2) | <input type="checkbox"/> Water Column Oxygen Metabolism
(SESDPROC-504-R2) |
| <input type="checkbox"/> Wipe Sampling
(SESDPROC-304-R2) | <input type="checkbox"/> Other: |

Field measurements will be collected in accordance with the following SESD FBSQTP:

- | | |
|---|--|
| <input type="checkbox"/> Field DO Measurement
(SESDPROC-106-R2) | <input type="checkbox"/> Field Measurement of ORP
(SESDPROC-113-R0) |
| <input type="checkbox"/> Field Measurement of Total Residue Chlorine
(SESDPROC-112-R2) | <input type="checkbox"/> Field pH Measurement
(SESDPROC-100-R2) |
| <input type="checkbox"/> Field Specific Conductance
(SESDPROC-101-R3) | <input type="checkbox"/> Field Temperature Measurement
(SESDPROC-102-R3) |
| <input type="checkbox"/> Field Turbidity Measurement
(SESDPROC-103-R2) | <input checked="" type="checkbox"/> Field XRF Measurement
(SESDPROC-107-R2) |
| <input checked="" type="checkbox"/> Global Positioning System
(SESDPROC-110-R3) | <input type="checkbox"/> Groundwater Level Measurement
(SESDPROC-105-R1) |
| <input type="checkbox"/> In Situ Water Quality Mon
(SESDPROC-111-R2) | <input type="checkbox"/> Wastewater Flow Measurement
(SESDPROC-109-R3) |
| <input type="checkbox"/> Other: | |

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Soil and Sediment Sampling

Grab sediment samples should be collected in accordance with FBSQTP for Sediment Sampling (SESDPROC-200-R2) from 0 to 4 inches bgs using stainless steel scoops.

Five point or three point composite surface soil samples should be collected from each of the residential properties in accordance with FBSQTP for Soil Sampling (SESDPROC-300-R2), from the 0 to 4 inches bgs interval at each aliquot location using stainless steel spoons, hand augers, or scoops.

Each surface soil or sediment sample should be homogenized in a stainless steel bowl. One 8-ounce jar should be filled and the remaining sample material should be placed in zip-top bags for screening. Information identifying the location, sample point, and date/time should be inscribed on each jar and zip-top bag.

All sample bags screened for metals with an XRF, should be transported to a central point at the site where the homogenized sample's moisture content will be measured with a portable moisture meter. If the sample's moisture content is greater than 20 percent (as measured with a portable soil moisture meter), the sample will be dried before screening with an XRF. Samples requiring drying should be placed open in a warm and dry location and/or in an oven to allow excess moisture to evaporate.

Once the sample has dried sufficiently, the zip-top bag should be compressed by folding over the excess plastic and removing as much air and space from the sample as possible. The XRF should be placed directly on the exterior of the compressed sample in the plastic zip-top bag to measure metals concentrations. XRF screening results will be used to determine further handling and analysis based on the EPA Memorandum "Recommendations for Use of XRF and Sieving of Soils; 35th Avenue Superfund Site" (February 12, 2013).

Samples requiring sieving should be divided into two subsamples; one subsample will be sieved through a #10 screen (2 mm) and the other will be left unsieved. The sieved portion should be screened with the XRF. The unsieved portion of the sample material should be containerized into one 8-ounce jar and the sieved portion of the sample should be containerized into another 8-ounce jar. All sampling jars should be labeled appropriately and then placed on ice.

Based on the decision the 8-ounce jars of surface soil and sediment samples should be submitted to a NELAC certified laboratory for low level PAH, and/or TCL SVOC, RCRA metals, and/or PCB analysis. RCRA metals will be analyzed from both the sieved and unsieved portions of samples. All other analysis shall be conducted on the unsieved portion.

Sampling activities will not be conducted during or one day after rain events, at the discretion of the OSC, to allow soil material to effectively dry prior to sample collection.

Sample containers used for sample collection will be QC grade purchased from ESS and will be prepared according to the procedures contained in the EPA Specifications and Guidance for Obtaining Contaminant-Free Sample Containers (OSWER Directive 93240.0-05).

The following lists the sampling equipment and supplies to be used during this investigation:

sampling instruments

- Niton[®] XRF
- Handheld GPS - Trimble GeoXT

sampling supplies

- Stainless Steel bowls
- Stainless Steel scoop/spoons
- Nitric preservative
- 1 Liter Ultra Pure Water (12)
- Coolers

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- Ice
- Strapping tape
- Custody seals
- Printer
- Sample Jar labels

Decontamination supplies

- Buckets
- Brushes
- Water
- Aluminum foil
- Distilled water
- Paper towels

PPE

- Nitrile gloves
- hand sanitizer
- hand soap
- water
- insect repellent
- hand wipes
- sunscreen

Other Items

- Logbooks

All investigation derived waste (IDW) will be managed according to the procedures found in the FBQSTP Management of Investigation-Derived Waste procedure (SESDFPROC-202-R2). All IDW will be properly disposed of according to best management practices and regulatory requirements.

B3. Sampling Handling and Custody

All samples will be handled and custody maintained in accordance with the FBQSTP Operating Procedure for Sample Evidence Management (SESDFPROC-005-R1) and Packing, Marking, Labeling and Shipping of Environmental and Waste Samples (SESDFPROC-209-R1).

Once collected, all samples will be placed in a custody-sealed container and held in a secure location. The FPL or his designee will ensure that custody of samples is maintained until they are shipped to the laboratory.

Chain-of-custody and associated field records will be used to document the samples from collection through delivery to the laboratory.

Samples will be processed using EPA Scribe software.

B4. Analytical Methods

The analytical parameters and associated laboratory analytical methods that will be used for this project are presented in Tables 1 - 4.

The laboratory analytical data packages will be validated by a START Sr. Chemist.

SESD:

N/A

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CLP:	N/A
Other:	TCL SVOC in accordance with SW826-8270D, low-level PAH in accordance with Low-Level SW846-8270D, PCB Aroclors in accordance with SW846-8082, PCB Congeners in accordance with EPA Method 1668A, and RCRA 8 metals in accordance with SW846-6010C/7471 (solids) 7470 (liquid)
B5. Quality Control	
Field:	<p>Quality control for field monitoring and measurements will be conducted in accordance with FBQSTP Field Sampling Quality Control (SESDPROC-011-R3).</p> <p>The following QC samples will be collected as part of this investigation:</p> <ul style="list-style-type: none"> • Field duplicates at a rate of 1 per 20 samples • Rinsate blanks after each decon event • Preservative blanks after the collection of surface water samples • Field blanks after the collection of surface water samples • MS/MSD samples at a rate of 1 per 20 samples.
Laboratory:	SW846 methods describe the required accuracy, precision, sensitivity of the analysis required for this project. The MDL/RLs for TestAmerica are provided in Attachment 1.
B6. Instrument/Equipment Testing, Inspection and Maintenance	
All equipment will be handled in accordance with the FBQSTP Equipment Inventory and Management procedure (SESDPROC-108-R3).	
B7. Instrument/Equipment Calibration and Frequency	
All equipment will be calibrated according to the manufacturer's instructions. In addition, all equipment will be handled in accordance with the FBQSTP Equipment Inventory and Management procedure (SESDPROC-108-R3).	
B8. Inspection/Acceptance for Supplies and Consumables	
All critical supplies and consumables for this field investigation are inspected and maintained by the OTIE Field Team Leader.	
B9. Non-direct Measurements:	
Optional (Applicability of this item is site-specific).	
B10. Data Management	
<p>The project manager will be responsible for ensuring that all requirements for data management are met. The reference materials generated during this investigation and included in the final reports will be submitted to the OSC in electronic format on compact disc, and a Scribe database will be created for the analytical results. The Scribe database will be submitted to the OSC with the final reports. All field-generated data will be managed as part of the permanent field record for the project. All laboratory analytical data will be managed in accordance with the requirements of the methods, as well as the EPA Region 4 policy and applicable federal regulations. Finally, all field-generated data and other records generated or obtained during this project will be managed according to the requirements of EPA START III Contract No. EP-S4-15-01.</p>	

QUALITY ASSURANCE PROJECT PLAN
U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)
REGION 4 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM (START)
ONEIDA TOTAL INTEGRATED ENTERPRISES (OTIE) – CONTRACT EP-S4-15-01

SECTION C: Assessment/Oversight

C1. Assessments and Response Actions

Assessments will be conducted during the field investigation according to the *SESD Operating Procedure for Project Planning*, SESDPROC-016-R1 to ensure the QAPP is being implemented as approved. The Project Manager is responsible for all corrective actions while in the field.

C2. Reports to Management

The Project Manager will be responsible for notifying the EPA Project Manager if any circumstances arise during the field investigation that may adversely impact the quality of the data collected.

SECTION D: Data Validation and Usability

D1. Data Review, Verification, and Validation

OTIE START will perform data assessment on laboratories' hardcopy (and electronic, where applicable) deliverables based on contractual and technical requirements outlined in the analytical method. The PM will review the data qualifier report to determine any data limitations and the impact of any qualified data on overall data usability for the project. Detailed guidance for data assessment may be found in the *Guidance for Data Quality Assessment* (EPA QA/G-9 2000).

D2. Verification and Validation Methods

The laboratory analytical data packages will be validated by an experienced Sr. START Chemist in accordance with the National Functional Guidelines (NFG). The following guidance documents shall serve as the basis for all data validation:

- USEPA National Functional Guidelines for Organic Data Review, (OSWER 9240.1-05A-P, PB99-963506, EPA 540/R-99-008, October 1999)
- USEPA National Functional Guidelines for Inorganic Data Review, (OSWER 9240.1-45, EPA 540-R-04-004, October 2004).
- USEPA National Functional Guidelines for Low Concentration Organic Data Review, (OSWER 9240.1-34, EPA540-R-00-006, June 2001)

The USEPA performs data validation using a "tiered" approach. The data packages will be evaluated and qualified for all quantitative QC elements e.g., spike recoveries, method and field blank contamination, duplicate sample %RSD, and instrument stability and performance (e.g., initial and continuing calibration results, instrument tuning and internal standard areas) using hard-copy summary forms. This Summary Validation of 100% of the data is equivalent to an EPA CLP "QA Level III" validation and is considered Tier 1. Specific QC elements that will be reviewed during the Summary Validation include:

- Presence and completeness of COC and "cooler receipt form" (also known as sample receipt form) documentation
- Sample Index (correlation of field sample ID to laboratory sample ID)
- Laboratory Case Narrative (method deviations and QC anomalies)
- Analytical holding times
- Where applicable, laboratory control standard recoveries
- Method blank contamination

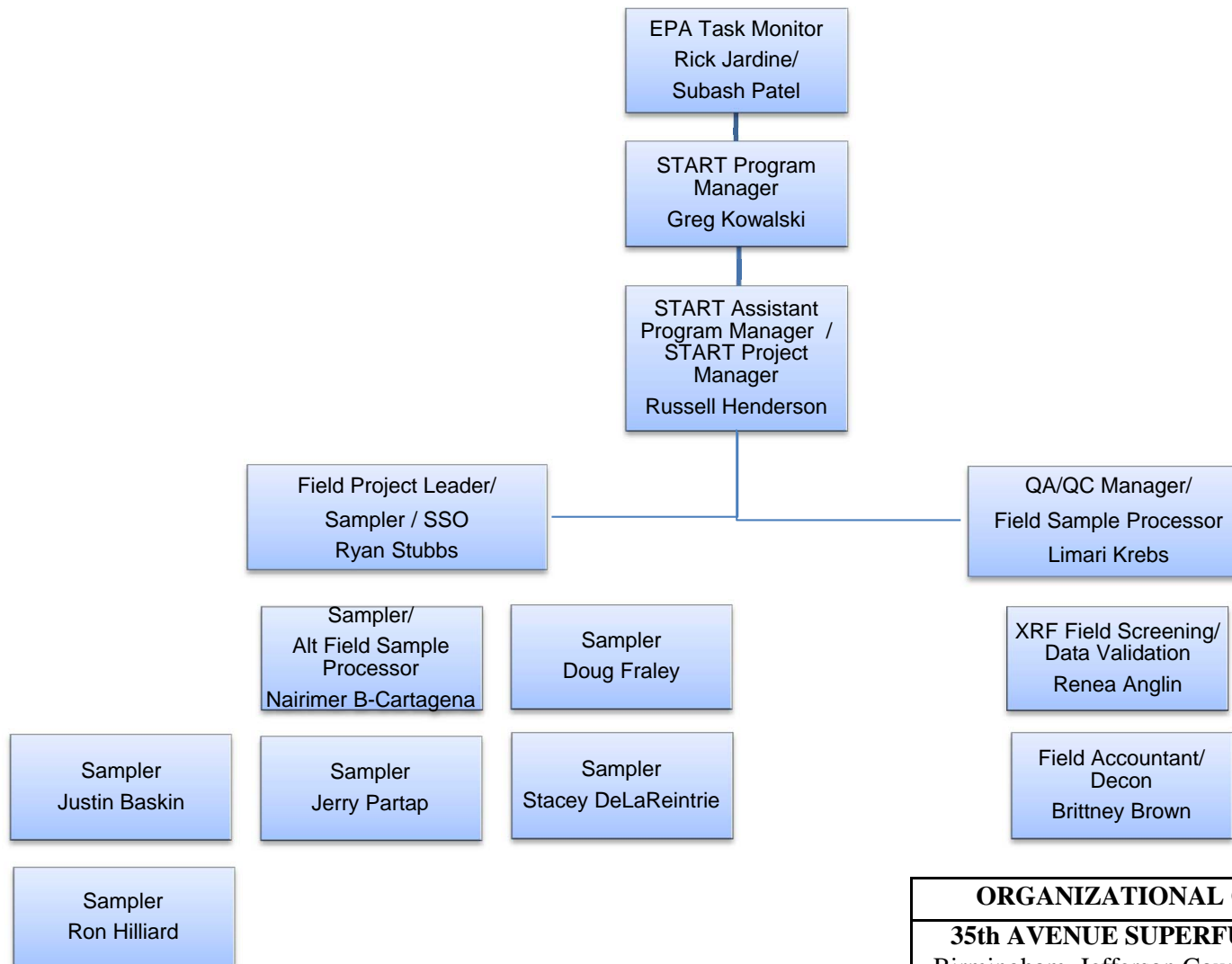
QUALITY ASSURANCE PROJECT PLAN
U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)
REGION 4 SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM (START)
ONEIDA TOTAL INTEGRATED ENTERPRISES (OTIE) – CONTRACT EP-S4-15-01

- Surrogate spike recoveries
- Matrix spike compound recoveries
- Matrix spike/matrix spike duplicate RPD values
- Field duplicate RPD values
- Laboratory Duplicate RPD values
- Summaries of initial and continuing Calibration
- Summaries of instrument blanks (e.g., initial calibration blank, CCB, if specified in method)
- Review of reagent/preparation blanks (inorganics)
- Review of Laboratory Control Standards (LCS)
- Instrument stability and performance (e.g., tuning, serial dilution)
- Summaries of internal standards

D3. Reconciliation with User Requirements

Data results and site findings are intended to be used by USEPA to make a determination regarding the impact of contaminants to the local environment. OTIE START will perform a review of contaminant concentrations and will summarize these findings in a final report to the USEPA.

****Footnotes:** This Quality Assurance Project Plan (QAPP) has been prepared and approved according to the EPA *Requirements for Quality Assurance Project Plans (EPA QA/R5 EPA/240/B-01/003)*, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March 2001 (USEPA, 2001). This document will be used to ensure that the environmental data collected for this project are of the type and quality for the intended purposes.



ORGANIZATIONAL CHART

35th AVENUE SUPERFUND SITE
Birmingham, Jefferson County, Alabama
TDD: 0002/02-0002



TABLE 1
ANALYTICAL METHODOLOGY, SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIME FOR SAMPLES
35TH AVENUE REMOVAL SITE

Matrix	Analysis	EPA Method	Sample Container	Preservative	Holding Time
Soil/Sediment	SVOC/PAH	SW846-8270D/SIM	One 8-oz glass Jar	Cool to 4 °C	14 days to extraction: 40 days to analysis
	RCRA 8 Metals	SW846-6010/7471	One 8-oz glass Jar	Cool to 4 °C	6 months/ (28 days for mercury)
	PCB Aroclor	SW846-8082	One 8-oz glass Jar	Cool to 4 °C	14 days to extraction: 40 days to analysis
	PCB Congener	EPA Method 1668A	One 8-oz glass Jar	Cool to 4 oC	1 year
Surface Water	SVOC/PAH	SW846-8270D/SIM	2 1L Amber Bottles	Cool to 4 °C	7 days to extraction ; 40 days to analysis
	RCRA 8 Metals	SW846-6010/7470	One 1-L poly bottle	HNO ₃ to pH< 2 Cool to 4 °C	6 months/ (28 days for mercury)

Notes:

°C - Degree Celsius
HNO₃ - Nitric Acid
L - Liter
oz - Ounce
PAH - Polycyclic Aromatic Hydrocarbon
PCB - Polychlorinated Biphenyls
SIM - Selective Ion Monitoring
SVOC - Semivolatile Organic Compounds
SW846 - Solid Waste 846 Methods
RCRA - Resource Conservation and Recovery Act

TABLE 2
TCL SVOC PROJECT TARGET PARAMETERS, REPORTING LIMITS, AND COMPARISON
VALUES
35th AVENUE REMOVAL SITE

Analyte	Cas No	Residential RML (ug/kg)	MDL (ug/kg)	RL (ug/kg)	SW846 Method
TCL PAHs					
1-Methylnaphthalene	90-12-0	NL	4.4	40	8270D-LL
2-Methylnaphthalene	91-57-6	690000	7.1	40	8270D-LL
Acenaphthene	83-32-9	10000000	20	100	8270D-LL
Acenaphthylene	208-96-8	NL	5	40	8270D-LL
Anthracene	120-12-7	52000000	4.2	8.4	8270D-LL
Benzo(a)anthracene	56-55-3	15000	3.9	8	8270D-LL
Benzo(a)pyrene	50-32-8	1500	5.2	10.4	8270D-LL
Benzo(b)fluoranthene	205-99-2	15000	6.1	12.2	8270D-LL
Benzo(g,h,i)perylene	191-24-2	NL	4.4	20	8270D-LL
Benzo(k)fluoranthene	207-08-9	150000	3.6	8	8270D-LL
Chrysene	218-01-9	1500000	4.5	9	8270D-LL
Dibenzo(a,h)anthracene	53-70-3	1500	4.1	20	8270D-LL
Fluoranthene	206-44-0	6900000	4	20	8270D-LL
Fluorene	86-73-7	6900000	4.1	20	8270D-LL
Indeno(1,2,3,-cd) pyrene	193-39-5	15000	7.1	20	8270D-LL
Naphthalene	91-20-3	360000	4.4	40	8270D-LL
Phenanthrene	85-01-8	NL	3.9	8	8270D-LL
Pyrene	129-00-0	5200000	3.7	20	8270D-LL
OTHER TCL SVOC					
1,1'-Biphenyl	92-52-4	150000	330	740	8270D
2,4,5-Trichlorophenol	95-95-4	18000000	35	330	8270D
2,4,6-Trichlorophenol	88-06-2	180000	29	330	8270D
2,4-Dichlorophenol	120-83-2	550000	35	330	8270D
2,4-Dimethylphenol	105-67-9	3700000	44	330	8270D
2,4-Dinitrophenol	51-28-5	370000	830	1700	8270D
2,4-Dinitrotoluene	121-14-2	160000	49	330	8270D
2,6-Dinitrotoluene	606-20-2	180000	42	330	8270D
2-Chloronaphthalene	91-58-7	19000000	35	330	8270D
2-Chlorophenol	95-57-8	1200000	40	330	8270D
2-Methylphenol	95-48-7	9200000	27	330	8270D
2-Nitroaniline	88-74-4	1800000	45	1700	8270D
2-Nitrophenol	88-75-5	NL	41	330	8270D
3,3'-dichlorobenzidine	91-94-1	110000	28	660	8270D
3-Nitroaniline	99-09-2	NL	46	1700	8270D
4,6-Dinitro-2-methylphenol	534-52-1	NL	170	1700	8270D
4-Bromophenyl-phenylether	101-55-3	NL	36	330	8270D
4-Chloro-3-methylphenol	59-50-7	18000000	35	330	8270D
4-Chloroaniline	106-47-8	240000	52	660	8270D
4-Chlorophenyl-phenyl ether	7005-72-3	NL	44	330	8270D
4-Methylphenol	106-44-5	18000000	43	330	8270D
4-Nitroaniline	100-01-6	730000	49	1700	8270D
4-Nitrophenol	100-02-7	NL	330	1700	8270D
Acetophenone	98-86-2	23000000	28	330	8270D
Atrazine	1912-24-9	NL	23	330	8270D
Benzaldehyde	100-52-7	23000000	58	330	8270D
Bis(2-chloroethoxy) methane	111-91-1	550000	39	330	8270D
Bis(2-chloroethyl) ether	111-44-4	21000	45	330	8270D

TABLE 2
TCL SVOC PROJECT TARGET PARAMETERS, REPORTING LIMITS, AND COMPARISON
VALUES
35th AVENUE REMOVAL SITE

Analyte	Cas No	Residential RML (ug/kg)	MDL (ug/kg)	RL (ug/kg)	SW846 Method
Bis(2-ethylhexyl) phthalate	117-81-7	3500000	29	330	8270D
bis(2-chloroisopropyl)ether	108-60-1	NL	30	330	8270D
Butylbenzylphthalate	85-68-7	26000000	26	330	8270D
Caprolactam	105-60-2	92000000	66	330	8270D
Carbazole	86-74-8	NL	30	330	8270D
Dibenzofuran	132-64-9	230000	33	330	8270D
Diethylphthalate	84-66-2	150000000	37	330	8270D
Dimethylphthalate	131-11-3	NL	34	330	8270D
Di-n-butylphthalate	84-74-2	18000000	30	330	8270D
Di-n-octylphthalate	117-84-0	NL	29	330	8270D
Hexachlorobenzene	118-74-1	30000	39	330	8270D
Hexachlorobutadiene	87-68-3	180000	36	330	8270D
Hexachlorocyclopentadiene	77-47-4	1100000	41	330	8270D
Hexachloroethane	67-72-1	130000	28	330	8270D
Isophorone	78-59-1	37000000	33	330	8270D
Nitrobenzene	98-95-3	390000	26	330	8270D
N-Nitroso-di-n propylamine	621-64-7	6900	32	330	8270D
N-Nitrosodiphenylamine	86-30-6	9900000	33	330	8270D
Pentachlorophenol	87-86-5	89000	330	1700	8270D
Phenol	108-95-2	55000000	34	330	8270D

Notes:

MDL - Minimum Detection Limit
NL - Not listed
PAH - Polycyclic Aromatic Hydrocarbon compounds
RL - Reporting Limit
RML - EPA Removal Management Levels for Chemical Contaminants at Superfund Sites (July 2012)
SVOC - Semivolatile Organic Compounds
TCL - Target Compound List
ug/kg - Micrograms per kilogram

TABLE 3
PROJECT TARGET INORGANIC PARAMETERS, REPORTING LIMITS, AND
COMPARISON VALUES
35th AVENUE REMOVAL SITE

Analyte	Cas No	Residential RML (mg/kg)	MDL (mg/kg)	RL (mg/kg)	SW846-Method
Arsenic	7440-38-2	39	0.59	2	6010
Barium	7440-39-3	46000	0.3	1	6010
Cadmium	7440-43-9	210	0.1	0.5	6010
Chromium	7440-47-3	27600	0.5	1	6010
Lead	7439-92-1	400	0.53	1	6010
Mercury	7439-97-6	20	0.0082	0.02	7471
Selenium	7782-49-2	4110	1	2.5	6010
Silver	7440-22-4	4110	0.096	1	6010

Notes:

mg/kg - Milligrams per kilogram

MDL - Method Detection Limit

RL - Reporting Limit

RCRA - Resource Conservation and Recovery Act

RML - EPA Removal Management Levels for Chemical Contaminants at Superfund Sites (July 2012)

TABLE 4
PCB AROCLOR PROJECT TARGET PARAMETERS, REPORTING LIMITS, AND
COMPARISON VALUES
35th AVENUE REMOVAL SITE

Analyte	Cas No	Residential RML (ug/kg)	MDL (ug/kg)	RL (ug/kg)	SW846 Method
Aroclor-1016	12674-11-2	12000	2.9	33	8082
Aroclor-1221	11104-28-2	14000	4.8	67	8082
Aroclor-1232	11141-16-5	14000	3.3	33	8082
Aroclor-1242	53469-21-9	22000	2.8	33	8082
Aroclor-1248	12672-29-6	22000	7.2	33	8082
Aroclor-1254	11097-69-1	3400	2.3	33	8082
Aroclor-1260	11096-82-5	22000	6.7	33	8082

Notes:

ug/kg - Micrograms per kilogram

MDL - Method Detection Limit

PCB - Polychlorinated Biphenyls

RL - Reporting Limit

RML - EPA Removal Management Levels for Chemical Contaminants at Superfund Sites (July 2012)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4

**61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960**

February 12, 2013

MEMORANDUM

SUBJECT: Recommendations for Use of XRF and Sieving of Soils
35th Avenue Superfund Site, Birmingham, Alabama

FROM: Glenn Adams, Chief
Technical Services Section
Superfund Support Branch

TO: Jeffery Crowley, On-Scene Coordinator,
Emergency Response and Removal Branch

As you have requested, the Technical Services Section (TSS) has reviewed the data you provided. We reviewed the results of lead and arsenic data comparing laboratory data to XRF data and/or the data from soil samples that were sieved and unsieved. Currently, the sampling and analysis protocol being followed at the 35th Avenue site is to take XRF readings of all samples and then sieve the sample and take another XRF reading and then send 10% of samples to a laboratory for lab analysis. This review was to help determine if sieving and laboratory analysis at this level is still needed. Below are TSS's recommendations after doing a statistical analysis of this data and concentrating on the specific data points close to the Removal Management Levels (RMLs) for lead and arsenic.

TSS has reviewed the data provided by the OSC and based on our review and the statistical analysis performed (see attached analysis), data within +/- 200 mg/kg of the lead RML, the lab and XRF data are positively correlated (correlation coefficient = 0.74). There was a similarly strong correlation between the sieved and un-sieved data (correlation coefficient = 0.74).

Just looking at the statistical analysis of this data, it could be concluded that sieving and laboratory data may not be necessary to make removal decisions with a reasonable degree of confidence. Yet when you focus on the lead data in these comparisons just above or just below the RMLs and determine if the differences in the sample preparation and/or data analysis would have resulted in a different decision for some residential yards. There is data

that would show exceedances of RMLs in the lab data and/or sieved data that are not shown when just using the XRF and/or un-sieved data.

The issues identified with the use of XRF and un-sieved arsenic data seem to be present in XRF results above the RML and just above and just below the RML for lead data. Since each of these data points typically represent all or part of a residential yard, more consideration needs to be given to the raw data than just using the statistical analysis alone. TSS recommends the following procedures to provide a higher level of confidence in the data used for decision making.

Recommendations for future Lead and Arsenic data/samples: Based on the data and the observations stated above, TSS recommends that any samples with XRF readings of lead between 200 mg/Kg and 600 mg/Kg should be sieved and sent to the lab for metals analysis. For arsenic, any XRF readings above 40 mg/Kg should be sieved and sent to the lab for metals analysis. The exception for arsenic can be when you have XRF lead data above 600 mg/Kg in the same sample, no further arsenic data typically would be needed because of the high lead concentrations which would drive the cleanup already. Typically, the sieved and lab data should be used as the main data set for your decision making, but there may be site specific situations that alter the typical procedure.

TSS recommends that lead concentrations in un-sieved samples greater than 600 mg/Kg and less than 200 mg/Kg can be used without needing to be sieved or sent to the lab. TSS also recommends that un-sieved samples with arsenic concentrations less than 40 mg/Kg can be used without needing to be sieved or sent to the lab.

Please let me know if you any questions or if there is anything additional you need. We can be available for a conference call to discuss this information at your convenience. You can reach me at 404-562-8771 if you have any questions.

ATTACHMENT

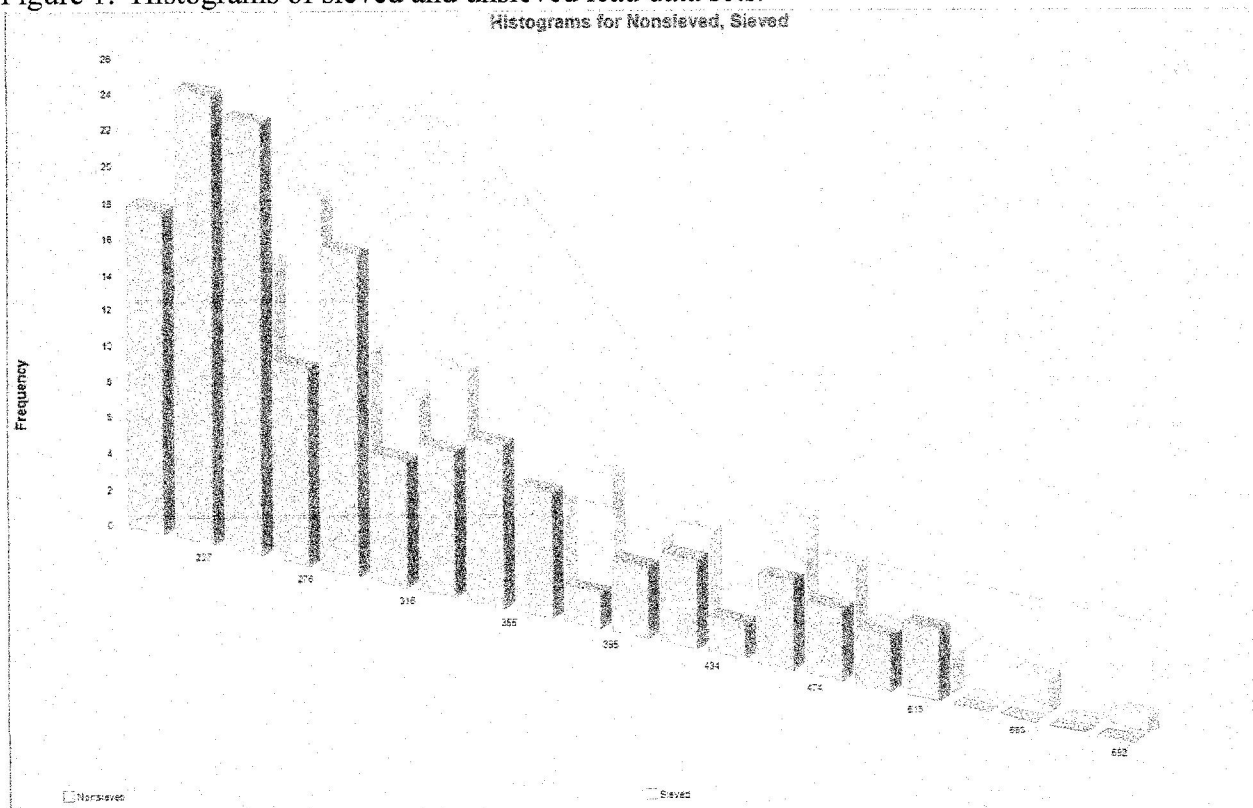
Summary statistics are presented in Table 1 for the un-sieved and sieved soil lead data. The summary data show that the measures of central tendency (mean/median) are similar and that the coefficients of variation, a measure of variability within each data set, are essentially identical for the data sets.

Table 1. Summary statistics for unsieved and sieved lead data sets.

Variable	N =	Mean	Median	CV
Un-Sieved	156	306	280	0.285
Sieved	156	325	296	0.29

A histogram of the two data sets shows that the distribution of the lead data sets appears to be very similar. (Figure 1)

Figure 1. Histograms of sieved and unsieved lead data sets.



Summary statistics are presented in Table 2 for the XRF and laboratory soil lead data. The summary data show that the measures of central tendency (mean/median) are higher for the samples analyzed in the lab. The coefficients of variation, a measure of variability within each data set, however are very similar for the data sets.

Table 2. Summary statistics for XRF and lab lead data sets.

Variable	N =	Mean	Median	CV
Lab	34	395	410	0.257
XRF	34	348	325	0.279

A histogram of the two data sets shows that the distribution of the data appears to have a similar shape, but the lab data are shifted slightly higher. (Figure 2) It is possible that these data would more closely mirror one another if the number of data points increased.

Figure 2. Histograms of lab and XRF lead data sets.

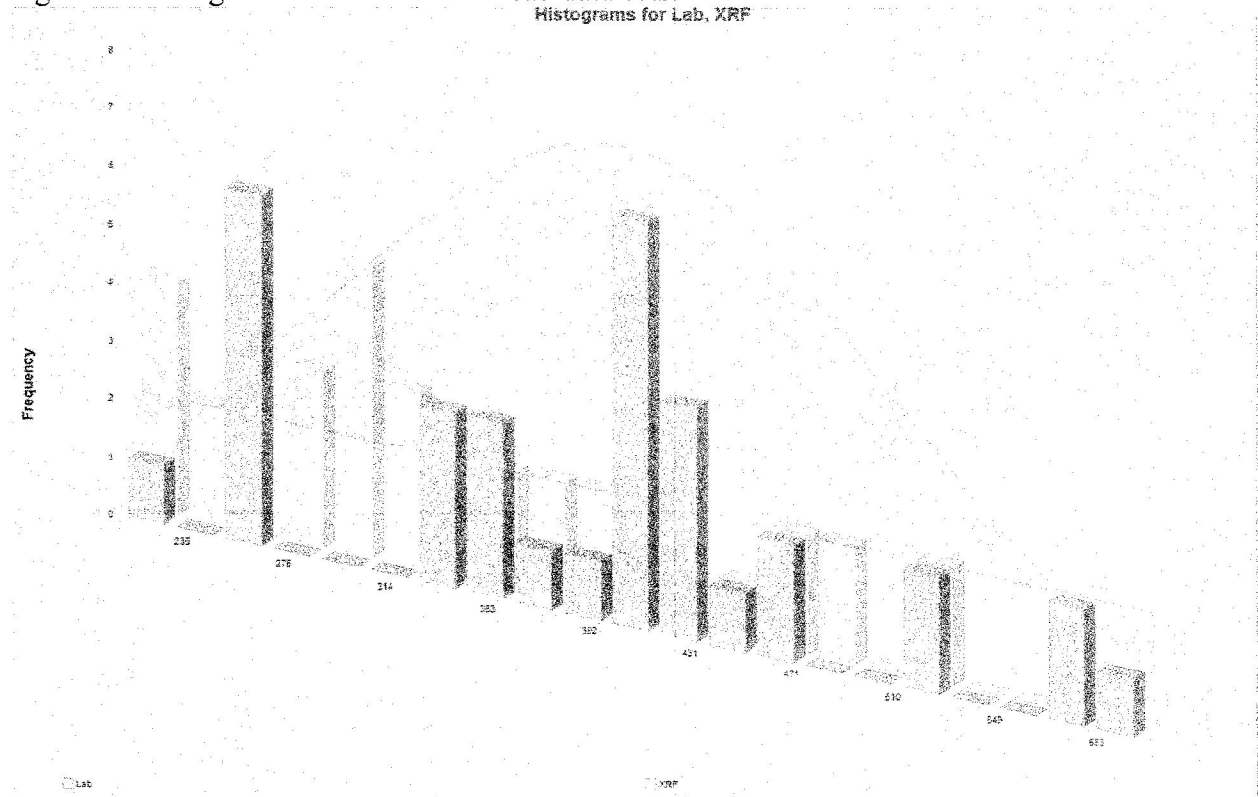
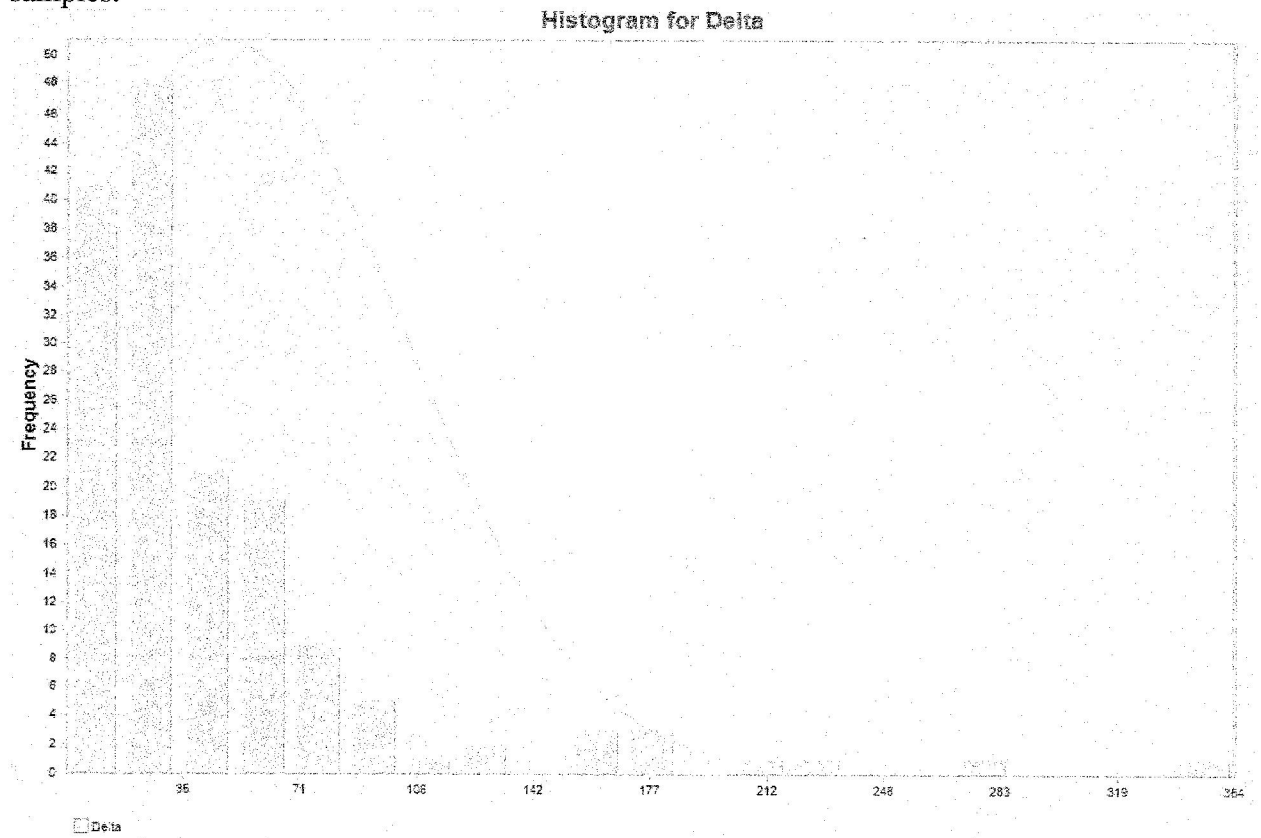


Figure 3 is a histogram of the absolute difference (delta) between the sieved and unsieved soil sample lead concentration data (n=156). The histogram shows that the difference was less than (+/-) 200 mg/kg in all but four samples. (Figure 3)

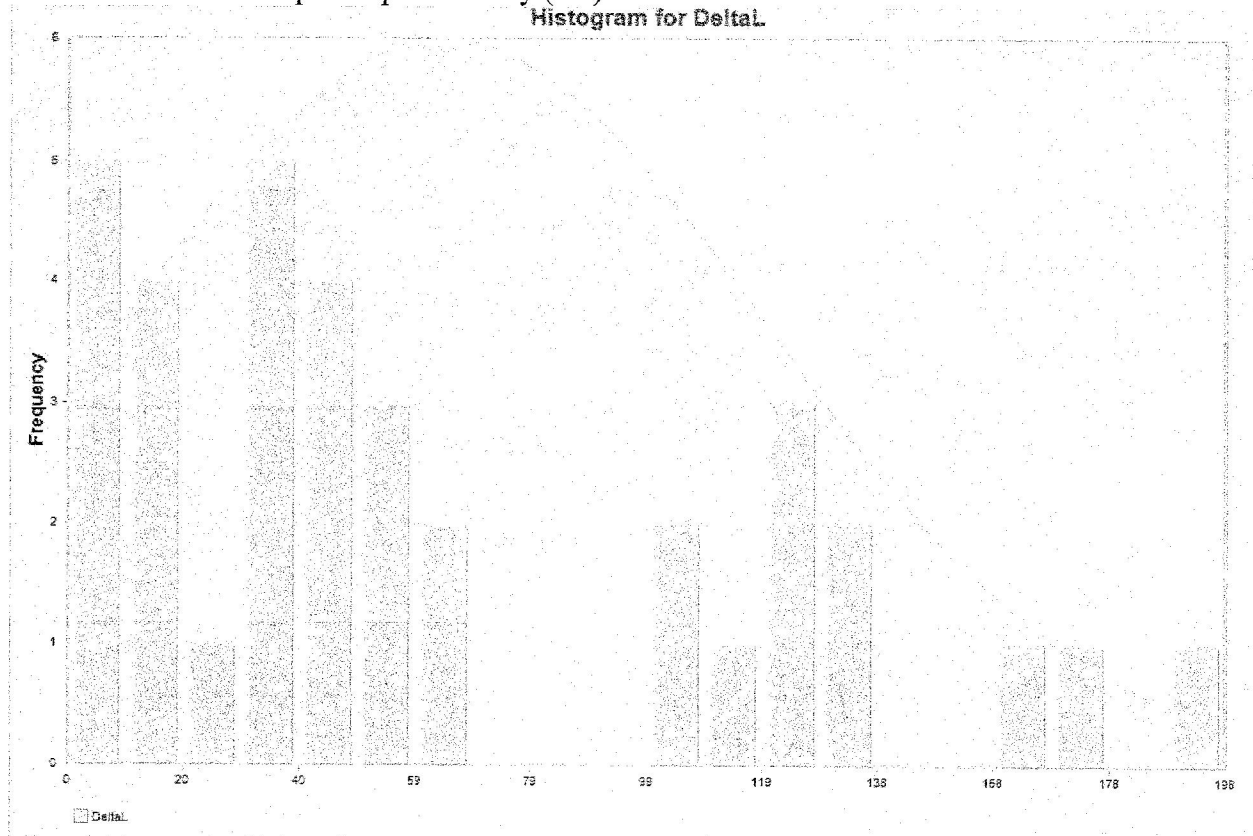
Figure 3. Absolute difference (delta) in lead concentrations the sieved and unsieved soil samples.



The data were also evaluated to determine when a potentially different decision would result depending on the type of sample preparation. In cases where the unsieved sample resulted in a concentration > 400 mg/kg of lead, there were only six instances where the corresponding sieved sample resulted in a concentration less than 400 mg/kg. In cases where the sieved samples were > than 400 mg/kg, there were fifteen instances where the unsieved sample was less than 400 mg/kg.

Figure 4 is a histogram of the absolute difference (delta) between samples analyzed in the field (XRF) and soil samples analyzed in the lab. The histogram shows that the difference was less than (+/-) 200 mg/kg in all sample pairs. (Figure 4)

Figure 4. Absolute difference (delta) in lead concentrations between samples analyzed by XRF and atomic absorption spectrometry (lab).



The data were also evaluated to determine when a potentially different decision would have been made depending on the type of sample analysis. In cases where the lab sample resulted in a concentration > 400 mg/kg of lead, there were ten instances where the corresponding XRF sample resulted in a concentration less than 400 mg/kg. In cases where the XRF samples were greater than 400 mg/kg, the corresponding lab sample was less than 400 mg/kg in only a single sample. .