A1. TITLE AND APPROVAL PAGE

QUALITY ASSURANCE PROJECT PLAN
for
0 Paul Avenue Environmental Cleanup
City of Atlanta Brownfields Revolving Loan Fund

Conducted Under
EPA Brownfields Cooperative Agreement Recipient (CAR) No. BF 95445109-4

Prepared for:

68 Mitchell Street, Suite 5100
Atlanta, Georgia 30303

Prepared by:

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Submittal Date:
May 8, 2020

Signature Approval:

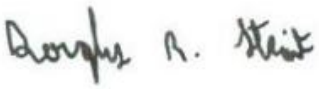
Cardno Project Manager:

Signature

Keith Ziobron, P.E. 05/08/2020

Printed Name / Date

Cardno QA/QC Officer:



Signature

Douglas Strait, P.E. 05/08/2020

Printed Name / Date

Assessment EPA Project Officer/ EPA Designated Approving Official (DAO):

Signature

Camilla Warren

Printed Name / Date

City of Atlanta Brownfields Program Director:

Signature

Jessica Lavandier

Printed Name / Date

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A3. DISTRIBUTION LIST

The following individuals will receive copies of the approved Quality Assurance Project Plan (QAPP) and any subsequent revisions:

- Camilla Warren, City of Atlanta Brownfields Revolving Loan Fund (RLF) Project Officer & EPA DAO, EPA Region 4, Sam Nunn Federal Center, 61 Forsyth Street Southwest, LCR Division, Brownfields Section, 10th Floor, Atlanta, Georgia 30303-8960, Phone: 404.562.8574, Email: warren.camilla@epa.gov

- Jessica Lavandier, Authorized Representative and Brownfields Program Manager, City of Atlanta and Invest Atlanta, 68 Mitchell Street SW, Atlanta, GA 30303, Phone: 404.330.6000, Email: jlavandier@atlantaga.gov

- Keith Ziobron, P.E., Cardno Project Manager, Cardno, Inc. (Cardno), 6611 Bay Circle, Suite 220, Norcross, Georgia 30071, Phone: 678.443.1197, Email: keith.ziobron@cardno.com

- Douglas Strait, P.E., Quality Assurance/Quality Control Officer, Cardno, 6611 Bay Circle, Suite 220, Norcross, Georgia 30071, Phone: 770.316.2466, Email: douglas.strait@cardno.com

- Stacy Funderburke, Owner, The Conservation Fund (TCF), 100 Peachtree Street NW, Suite 230, Atlanta, GA 30303, Phone: 404.221.0405, Email: sfunderburke@consrvationfund.org

- Tom Harper, ETRI Project Manager, Environmental Technology Resources, Inc. (ETRI), 4780 Ashford Dunwoody Road, Suite A-456, Atlanta, GA 30338, Phone: 770.888.8181; Email: etri@mindspring.com

- Jon King, Project Manager, AquaTerra Recycling & Treatment (AquaTerra), 710 Moore Street, Oxford, GA 30054, Phone: 678.625.4025, Email:

- Ioana Pacurar, Laboratory Project Manager, Analytical Environmental Services, Inc. (AES), 3080 Presidential Drive, Atlanta, GA 30340, Phone: 770.457.8177, Email: ipacurar@aesatlanta.com

A4. PROJECT/TASK ORGANIZATION

Cardno was selected by the City of Atlanta (City) as their Qualified Environmental Professional (QEP) and is responsible for preparing the QAPP for the lead impacted soil removal at 0 Paul Avenue and assisting the City in programmatic support services and grant management activities under their Environmental Protection Agency (EPA) Brownfield RLF Cooperative Agreement Recipient Number BF 95445109-4.

A checklist of the required content references and location within this document is provided in Appendix A. A project organization chart is included in Appendix B. The following are the individuals participating in the project and their specific roles and responsibilities:

Camilla Warren, EPA Region 4 City of Atlanta Brownfields RLF Grant Project Officer/DAO - Ms. Warren is responsible for overseeing and monitoring the City's RLF grant. As part of that responsibility, she ensures the processes described in the work plan are followed and the terms and conditions of the grant are met. The DAO's role is to provide technical reviews of the QAPPs and QAPP Addenda that are generated.

Jessica Lavandier, City of Atlanta Brownfields Program Manager – Ms. Lavandier is responsible for the overall strategic direction of the project and ensures project activities are executed in accordance with the approved Work Plan and the Terms and Conditions of the Cooperative Agreement. She will also coordinate with Invest Atlanta which manages the financial aspects of the City of Atlanta Brownfield RLF program.

Keith Ziobron, Cardno Project Manager – Mr. Ziobron is the primary decision maker for the project and the primary user of the data to determine whether or not further action is required at the site. His specific responsibilities include:

1. Approving the QAPP and subsequent revisions in terms of Brownfields specific requirements for the QEP;
2. Overall responsibility of the cleanup project;
3. Overseeing project activities in accordance with the QAPP and Design;
4. Validating field data;
5. Making final project decisions with the authority to commit the necessary resources to conduct the project;
6. Instituting corrective actions for problems encountered in the field sampling activities; and
7. Communicating corrective actions to TCF and their respective contractor Project Managers to remedy problems encountered in the field and coordinating to correct any corresponding problems encountered.
8. Compiling documentation detailing any correct actions and providing them to the City of Atlanta Project Manager.
9. Audit contractors relative to Davis-Bacon Act compliance.

Douglas Strait, QA/QC Officer – Mr. Strait will assist the Cardno Project Manager in overseeing project activities in accordance with the QAPP and Design. As the QA/QC Officer, he provides documentation audits and technical review to assist in promoting, implementing, and documenting QA compliance.

Stacy Funderburke, The Conservation Fund (TCF), Property Owner and Loan Recipient – Mr. Funderburke represents the owner of the 0 Paul Avenue property and manages the overall redevelopment of the property. He will be the main point of contact between the City of Atlanta, Cardno, and the contractors performing the cleanup work. As the recipient of the RLF loan, he is responsible to ensure the processes described in the Cleanup Work Plan and QAPP are followed and the terms and conditions of the loan and grant are met.

Tom Harper, ETRI, TCF Representative and Cleanup Project Manager – The Cleanup Project Manager will coordinate project activities. He will reduce raw field data to determine if further corrective action is required at the site. Specific responsibilities include:

1. Overall responsibility of the environmental investigation and remediation oversight;
2. Coordinating field and laboratory activities;
3. Conducting project activities in accordance with the QAPP and the Cleanup Work Plan;
4. Upon receipt from the Cardno Project Manager, Make available the approved QAPP documents and subsequent revisions to the members of the sampling team.
5. Select the field sampling team and discuss project details with the Cardno Project Manager.

6. Conduct the field activities per the approved QAPP documents and supervise the field sampling team.
7. Report any field sampling problems to the Cardno Project Manager.
8. Implement corrective actions in the field as directed by the Cardno Project Manager. Corrective actions will be documented in the field logs and provided to the Cardno Project Manager.

Jon King, AquaTerra Project Manager – Mr. King will oversee the soil remediation activities conducted by AquaTerra, TCF's selected remediation contractor. Specifically, he will perform the following duties:

1. Provide continual oversight of soil remediation activities to ensure compliance with the Cleanup Work Plan and QAPP.
2. Upon receipt from the Cardno Project Manager, make available the approved QAPP documents and subsequent revisions to the members of the remediation team.
3. Report any remediation activity problems to the Cardno Project Manager.
4. Implement corrective actions in the field as directed by the Cardno Project Manager. Corrective actions will be documented in the field logs and provided to the Cardno Project Manager.

Ioana Pacurar, AES Laboratory Project Manager –Ms. Pacurar is responsible for the following:

1. Coordinating the analysis of the samples and the laboratory validation of the data;
2. Coordinating the receipt of the samples at the laboratory, selecting the analytical team, ensuring internal laboratory audits are conducted per the Laboratory's Quality Assurance Manual (QAM), and distributing the applicable sections of the QAPP and subsequent revisions to members of the analytical team;
3. Instituting corrective actions for problems encountered in the chemical analyses and reporting laboratory problems affecting the project data to the Cardno Project Manager and Cardno QA/QC Reviewer. Corrective actions for chemical analyses will be detailed in a QA report that will be provided via electronic and conventional mail.

A5. PROBLEM DEFINITION/BACKGROUND

The City of Atlanta (City) received an EPA Brownfields Revolving Loan Fund (RLF) in 2009 (BF 95445109-4). This funding is being used in part to prepare the appropriate documents for the cleanup of 0 Paul Avenue, which is to also be funded with the City's EPA Brownfields RLF Grant.

Documents developed under the City's EPA RLF Grant include the following:

- Analysis of Brownfield Cleanup Alternatives (ABCA)
- Quality Assurance Project Plan (QAPP, this document)
- Cleanup Work Plan

The cleanup will occur on one parcel of property totaling approximately 0.2009 acre rectangular shaped tract of land located at 0 Paul Avenue (herein referred to as "Subject Site/Property"). The Subject Site extends 175 feet northwest towards an adjoining railroad track with 50 feet of frontage along Paul Avenue to the southeast. The Subject Property is currently mostly cleared and undeveloped. The Subject Site is illustrated by the Site Layout Map and a Tax Map are included as Attachment C Figures 1 and 2.

Based on available resources, the property was undeveloped prior to 1938. By 1943, Paul Avenue had been constructed and formed the southeastern boundary. By the late 1960s, a rail line had been constructed which bordered the Subject Property to the northwest. The Subject Property has remained undeveloped since the late 1930s.

Multiple environmental investigations, including previous soil removal activities, have occurred on the Subject Site as early as 1995. The information obtained during these assessments was utilized to guide site activities with respect to potential environmental impairment and liabilities associated with the property due to contamination by hazardous substances, controlled substances, or petroleum products on or near the site.

In 1995, a complaint was issued to the Georgia Environmental Protection Division (EPD) Hazardous Waste Management Branch due to the presence of suspect fill material at the adjoining 2386 Paul Avenue property. It was suspected that this fill originated from a nearby Former Bernath Barrel and Drum, Inc. facility. This fill material was initially investigated in 1995 and then again in 2002, and it was determined to contain impacts from heavy metals, including arsenic, barium, lead, and silver. This impacted soil was delineated onto the Subject Property and two adjoining parcels to the southwest.

As Georgia Power owned the parcel between 2386 Paul Avenue and the Subject Site, they claimed responsibility and under the direction of the Georgia EPD completed soil removal activities in 2006. During their cleanup, one temporary monitoring well was installed and no evidence of groundwater impacts were identified. A Compliance Status Report (CSR) outlined the removal activities and groundwater sampling event and excerpts of the report are included in Appendix D.

On behalf of the Owner and Loan Recipient, The Conservation Fund, ETRI completed additional soil sampling at 0 Paul Avenue to verify the adequate removal of lead impacted soil. Initial sampling occurred in September 2018, with additional sampling in November 2018, and 15 soil borings were advanced between 0 – 10 feet below ground surface (bgs). Most soil samples were collected between 0-4 feet bgs, with a few samples collected at 5 and 10 feet bgs. Samples were only analyzed for lead.

In summary, four locations contained lead impacts between 0-4 feet bgs above its Georgia EPD Type 1 (residential) Risk Reduction Standard (RRS). Several other samples contained elevated concentrations of lead, but were below the Type 1 RRS. Sampling locations are depicted in Appendix C Figure 3.

Based on these findings, ETRI submitted a Prospective Purchaser Corrective Action Plan (PPCAP) on behalf of The Conservation Fund for entry into the Georgia EPD Brownfield Cleanup Program (BCP) in September 2019. This PPCAP outlines the previous sampling and investigations, and an excerpt of this report is included in Appendix D.

Georgia EPD responded in September 2019 with request for revisions to the PPCAP, including sampling for additional metals of concern and the collection of groundwater samples to indicate baseline conditions and to obtain groundwater flow direction. These revisions are currently being evaluated by ETRI and TCF, and will be addressed prior to the implementation of soil remediation.

The purpose of this cleanup is to remove soil impacted with substances exceeding regulated threshold levels. Grant funding for the cleanup will be provided via the City's Brownfields RLF grant using hazardous substance funding.

A6. PROJECT/TASK DESCRIPTION AND SCHEDULE

Based on the previous investigations and the Cleanup Work Plan, the following section describes the cleanup actions to be conducted as part of the soil excavation.

The cleanup activities will be completed in conjunction with the negotiated requirements of the Georgia State Historic Preservation Office (SHPO) and Georgia Historic Preservation Division (HPD).

As Subject Site was accepted into the Georgia EPD Brownfield Program in October 2019, the project will be performed under the supervision of the following: Georgia EPD Brownfield Redevelopment Unit in accordance with O.C.G.A. Section 12-8-200 ("Brownfield Act" or "Act"). In addition, all work will utilize Region 4 Science and Ecosystem Support Division (SESD) "Field Branches Quality System and Technical Procedures" as a guide (https://www.epa.gov/quality/quality-system-and-technical-procedures-lsasd-field-branches)

Task 1: Health and Safety Plan Requirements

Prior to beginning cleanup activities, separate Site-Specific Health and Safety Plans (HASP) for Cardno personnel and contractors retained by the owner will be prepared to meet the requirements of the Occupational Safety and Health Administration (OSHA) Standard 1910.120. These documents will outline potential hazards, the level of personal protection to be used, and the procedures to be followed for monitoring and emergency situations at the Subject Site.

It is assumed that the fieldwork will be performed in Level D personal protection including at a minimum: safety-toed boots, hard-hats, high-visibility clothing/vests, and safety glasses. The Georgia 811 Safe-Dig Utility Protection Center must be contacted to locate underground utilities at least 48 hours prior to initiating subsurface disturbance.

Task 2: Design Phase Investigation

In response to the Georgia EPD comments and to further delineate the lead impacts, design phase investigation will be completed prior to the implementation of cleanup activities. This design phase investigation will consist of the following:

- Property boundary survey to accurately identify property boundaries and define the limits of investigation.
- Install six additional soil borings to delineate the limits of soil impacts. Borings will be advanced via a direct-push technology (DPT) and extended between 0-4 feet bgs. Soil samples will be analyzed for constituents of concern (COCs), as outlined in Section B1 of this document.
    - Four of the borings are to be located on the north-northwest side of the property
    - One boring is to be located on the south-southeast side of the property
    - One boring adjacent boring B1 and to be additionally analyzed for toxicity characteristic leachate procedure (TCLP) 8 RCRA metals for waste characterization purposes

- Three of the soil borings will be advanced via DPT to five feet below the groundwater table (approximately 25 feet bgs), and to be converted to temporary monitoring wells.
    - Two temporary wells on the northwest portion, and one on the southeast portion
    - Once installed, temporary wells will be developed until they produce sediment free water, and prior to sampling purged a minimum of three well volumes. Samples will be analyzed for COCs as outlined in Section B1 of this document.
    - Determine top of casing elevation of the temporary wells to determine groundwater flow direction
- Pending the results of the TCLP sample, a waste profile will be developed and submit the profile for possible disposal in a Subtitle D Landfill.

The proposed boring and temporary monitoring well locations are provided in Appendix C Figure 4. The purposes of each of the proposed soil boring and temporary monitoring wells is discussed in Section B1 of this document.

Task 3: Lead Impacted Soil Removal

Currently, soil impacted by lead is documented between 0 and 2 feet bgs in four locations at the Subject Site. Currently, the amount of lead impacted soil is estimated to be approximately 630 cubic yards (CY). A map depicted the current estimated area of soil removal is included as Appendix C Figure 5.

As discussed previously, a Design Phase Investigation will be conducted prior to the start of excavation activities to further delineate the soil lead impacts, verify the absence of other heavy metals in soil, and to determine a baseline for groundwater impacts.

Upon delineation, impacted soil will be excavated horizontally and vertically with the Subject Site's boundaries to where no impacts are detected above the Georgia EPD Type 1 RRS. Specifically, soil will be remediated in accordance with Chapter 391-3-19 of the Georgia EPD Hazardous Site Response Act (HSRA) criteria for corrective action, which is outlined in the Cleanup Work Plan. If additional impacts are encountered below these depths, then additional soil excavation may be required to achieve unconditional closure status.

All impacted soil will be removed, containerized, labeled, transported, and disposed of at a landfill licensed to accept the waste as profiled. The impacted materials will likely be characterized as non-hazardous and be disposed of at a Subtitle D Municipal Solid Waste Landfill. In order to expedite the disposal process, approval from a disposal facility of regulated wastes will be obtained in writing prior to transport of excavated soil (as outlined in Task 2).

The following additional measures may be considered during soil removal activities:

- Based on the estimated amount of soil removed, a land disturbance permit may be required with the City of Atlanta and if necessary will be obtain prior to implementation of remedial activities;
- Stockpiled soil will be stored on site, and the excavation pit will protected with a temporary six foot (minimum) chain-link fence;
- Cover staged/stockpiled soil with a three-millimeter (mil, minimum) thick plastic sheeting; and
- Implement best management erosion control practices in areas of exterior, exposed, soil, such as hay bales or silt fencing.

Schedule

The City's Brownfields RLF grant will have a general schedule that will guide the process for this cleanup. The soil removal field activities are anticipated to commence within 30 days of the final QAPP approval. According to estimates from the selected remediation contractor, AquaTerra, soil removal activities should take approximately 5 working days.

The following programmatic schedule is provided below, which outlines the approximate schedule for the EPA Grant programmatic requirements.

0 Paul Avenue Programmatic Schedule			
Task	Approximate Start Date	Approximate End Date	Actual End Date/Progress Notes
Public Engagement Meeting – Neighborhood Planning Unit D	April 28, 2020	April 28, 2020	April 28, 2020
Public Comment Period	April 28, 2020	May 27, 2020	-
Public Engagement Meeting – Cleanup Specific	May 12, 2020	May 12, 2020	-
Cleanup Work Plan	April 1, 2020	May 29, 2020	-
ABCA	April 1, 2020	May 29, 2020	-
QAPP	April 1, 2020	June 5, 2020	-
Subgrant Approval	June 18, 2020	June 18, 2020	-
Design Phase Investigation	June 22, 2020	July 17, 2020	-
Cleanup Activities	July 20, 2020	July 24, 2020	-
Compliance Status Report (EPD BCP)	July 27, 2020	September 28, 2020	-
RLF Closeout Report	September 29, 2020	October 20, 2020	-

This schedule will allow EPA a comment and review period for this QAPP and any subsequent revisions. Public notice was initially provided during a Neighborhood Planning Unit (NPU) D virtual meeting on April 28, 2020, with another cleanup specific community engagement virtual meeting to be held May 12, 2020. This will allow for adequate time for public comment and review prior to start of work.

The Design Phase Investigation is anticipated to take approximately 30 days. Laboratory analytical results from the Design Phase Investigation will be requested for a 10-day or sooner rush turnaround times. If the Design Phase Investigation identified additional concerns or significant changes to the overall cleanup strategy that alters this schedule, the updated schedule will be provided in a QAPP Addendum.

Soil remediation activities is anticipated to take approximately five working days. Laboratory analytical results from excavation confirmation samples will be requested for a two-day or sooner rush turnaround times.

As the cleanup is designed to provide closure with the Georgia EPD through the Brownfield Program, and as such a Compliance Status Report will be completed within two months of completion of all cleanup activities. Upon completion of the Compliance Status Report, a RLF closeout report will be completed.

A7. QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT

The following seven steps are used to determine the criteria for project specific data quality objectives (DQO) when performing cleanup projects funded under the City's Brownfields RLF grant.

1) State the Problem:

   Lead impacted soils are present throughout the Subject Site. Impacted soil has the potential to harm human health and the environment.

2) Identify the Decision

   Design phase investigation to further characterize and delineate the impacts, and then excavate, dispose of contaminated soil off-site, and backfill with clean soil.

3) Identify Inputs to the Decision
   - Previous soil and groundwater investigations conducted at the Subject Site
   - Historical records and documents with industry-specific experience
   - ETRI's PPCAP, September 2019 and subsequent EPD comments

4) Define the Study Area Boundaries

   Soil impact locations are provided in ETRI's PPCAP included as Appendix D, and are further illustrated on Appendix C Figures 3 and 5.

5) Develop a Decision Rule

   Proceed with Design Phase Investigation and then soil excavation.

6) Specify Limits on Data Gaps/Errors

   Limits on data gaps and errors associated with analytical sampling are specified throughout this document. There are data gaps identified with respect to the previous reports which will be addressed with the Design Phase Investigation. If further data gaps are identified, they will require management decisions during the implementation of cleanup activities.

7) Optimize Design

   The optimized design and sampling requirements are included in the Cleanup Work Plan (included as Appendix E) and throughout this document.

A8. SPECIAL TRAINING REQUIREMENTS/CERTIFICATIONS

This section outlines the minimum training requirements for personnel conducing project activities. Current training records and certificates are kept in personnel files located at the respective headquarters of the project personnel. Specifically, these training documents will be kept on-site by the following key personnel:

- AquatTerra will ensure training certifications are kept for AquaTerra personnel on-site in a field trailer (or an on-site location), with copies made available to the Cardno Project Manager and TCF and

their representatives. These records will also be kept at AquaTerra's Oxford office located at 710 Moore Street, Oxford, GA 30054.

- TCF and their representatives will keep records of all their employees and contractors training certifications at their office located at 100 Peachtree Street NW, Suite 230, Atlanta, GA 30303.
- Cardno will keep records of all their employees' training certifications on their person and at their Atlanta office located at 6611 Bay Circle, Suite 220, Norcross, GA 30071.

All training records will be made available upon request. Deficiencies and the need for new training are identified during annual personnel evaluations. Personnel deficient in any of the following requirements will not be allowed to conduct project activities.

Hazardous Waste Operations and Emergency Response (HAZWOPER)

The respective project managers will ensure that all on-site personnel have current certificates of training for the 40-hour Occupational Safety and Health Administration (OSHA) HAZWOPER Training Class with annual 8-hour refresher courses. All personnel mobilizing to the site shall carry a Certificate of Training identification card.

Certifications

- Qualified drilling contractor experienced with construction monitoring wells under the supervision of an ETRI Professional Engineer/Geologist will be contracted to facilitate project objectives.
- Excavation activities will be performed by AquatTerra with certified training requirements as outlined by OSHA regulations to conduct the functions that they are assigned.
- Analytical Environmental Services, Inc. (AES), will perform the analysis of the environmental samples in compliance with any and all applicable regulations and standards.

Any other personnel (City, EPA, RLF, contractors, etc.) visiting the Subject Site during cleanup activities, must ensure their personnel have at a minimum an OSHA 40-Hr HAZWOPER training certification. If they are to enter any regulated contained areas, then additional training certifications may be required. All training certifications will need to be verified as a pre-requisite for site visit(s).

A9. DOCUMENTATION AND RECORDS

All project documents will be filed per Cardno's standardized project filing system; with all original documents held by Cardno's Norcross, Georgia office (6611 Bay Circle, Suite 220, Norcross, GA 30071). All field-generated documents will be filed at TCF office (100 Peachtree Street NW, Suite 230, Atlanta, GA 30303) and their representatives ETRI's office (4780 Ashford Dunwoody Road, Suite A-456, Atlanta, GA 30338). All final project deliverables will be available for review at the Atlanta City Hall Planning Department office (68 Mitchell Street SW, Atlanta, GA 30303) or at Cardno's Norcross, GA office. All documents will be maintained

electronically and/or by hard copy for at least five years.

All technical documents and records will be maintained in accordance with the requirements set forth in the US EPA Region 4, Science and Ecosystem Support Division (SESD), "*Field Branches Quality System and Technical Procedures*"(*http://www.epa.gov/region04/sesd/fbqstp*).

General Project Documentation and Records

General project documentation includes the following:

- Facility study plan (scope of work)
- Health and Safety Plans
- Agency notifications, permits, and compliance documentation
- Original chain of custody records and field log/books/notes
- Records obtained during the cleanup
- Field notes with field crew signatures or initials on all records/notes
- Record of use of field sampling and decontamination supplies, and equipment tracking
- Progress/status reports (to be submitted every week to the City of Atlanta and Cardno)
- Correspondence directly-related to the project
- Data validation/quality assessment reports
- Project audit and QA/QC reports

Field notes must be recorded during all site visits and typically include:

- Names of personnel, subcontractors, and others on-site
- Date and chronological summary of field activities
- Ambient conditions
- Sample location descriptions, sample ID (when applicable)
- Sampling equipment
- Field decontamination procedures
- Field calibration records
- Types of quality control samples collected
- Sampler signature
- Results of QC checks
- Documentation of all problems encountered in the field with corrective action resolution

Project records will include all correspondence, field logs and data sheets, laboratory analytical reports, audit findings, waste manifests, progress reports, and a closeout report. Progress reports will be submitted weekly to the City and Cardno, and will include at a minimum the following:

- Activities performed

- Personnel and equipment on-site
- Waste removed
- Lessons learned
- Deviations from the Design
- Updated schedule

Laboratory Documentation

When samples are collected for purposes of identifying additional materials or waste characterization, chain-of-custody records must accompany all samples from origin through disposal. All sample containers are labeled with sample location identification (ID), preservative, sampler name, analyses required, and date/time of collection. The sample location ID is linked to the labels, chain-of-custody, and field notes. The chain-of-custody record typically includes the following information:

- Project name and address
- Date and times of sample collection
- Name of sampler
- Sample location ID
- Number of samples
- Analyses required with preservation method
- Timeframe (days) sample results are needed

The laboratory analytical results are typically provided via electronic copies generally within 14 calendar days of sample receipt. Paper copies will be supplied by the laboratory only upon request or will be printed from the electronic copy by the Cleanup Project Manager. Upon receipt, Laboratory Data are reviewed by the Cleanup Project Manager and made available for review to the Cardno Project Manager. The electronic copy will be placed in a server, which is routinely "backed-up" to ensure data integrity.

The laboratory analytical report will include the following required information at a minimum:

- The dates of sample receipt, preparation, and analysis
- The condition of the samples upon receipt
- Sample preparation and analysis
- Any problems encountered during sampling, handling, storage, preparation, or analysis, and their solution
- Any variance from the standard operating procedures
- And a discussion of the quality of the reported analytical data

The laboratory will manage the original raw data and data validation report in both hard copy and electronic format. This information will be made available to the Cleanup Project Manager and Cardno Project Manager for their review. The Laboratory Director will maintain information on where the records are stored, and will

identify who will be responsible for records management and how long specific types of records or documents will be maintained.

Progress and Closure Reports

A copy of the Georgia EPD Compliance Status Report (CSR) which summarizes the project closure in accordance with Georgia EPD regulations will be submitted to the City and Cardno by the Cleanup Project Manager. This report will be submitted to the City and Cardno within 60 days of project completion in order to receive and match waste manifests with landfill receipt tickets in compliance with the schedule provided in Section A6. Cardno will review this report, and include additional documentation to be submitted to the City and EPA which will include documentation of field activities (via weekly logs), a summary of all collected field data, analytical data reports, summary of design phase investigation and soil removal activities, analytical data, a written report of the audit of field activities (see Section C1 below), and copies of the waste manifests and landfill tickets that have been matched together proving proper disposal. The closure report typically includes the following components:

- Executive Summary
- Introduction/Background
- Site Description
- Abatement Activities
- Clearance Results
- Waste Profiles, Manifests, and Final Landfill Tickets (tabulated)
- Summary and Conclusions

B1. SAMPLING DESIGN PROCESS

This QAPP establishes minimum requirements for the design phase investigation, confirmatory soil sampling, and waste disposal characterization.

Design Phase Investigation

Collection and analysis of soil and groundwater samples are intended to initially identify the presence or absence of regulated substances such that informed decisions can be made regarding exposure potential impacts associated with these environmental media, and to provide a preliminary assessment of vapor encroachment risk. Proposed sampling locations are identified on the Proposed Sampling Location Map, which is included as Appendix C Figure 4. *It should be noted that execution of the planned assessment activities will not commence until this Site-Specific QAPP is approved by the EPA, and that specific sampling locations are subject to change depending on field conditions.*

During the advancement of soil borings via DTP, soil cores will be logged for lithology. Given the COCs, no photoionization detector (PID) screening is anticipated, but soil will be visual and olfactory characterized for evidence of impacts. All soil borings are to be advanced a minimum of 10 feet bgs. A minimum of one soil

sample will be collected from each boring between 0-1 foot bgs, with additional samples collected between 1 – 5 feet bgs depending on the previously identified depth of impact.

The collected soil and groundwater samples will be submitted to Analytical Environmental Services, Inc. (AES) in Norcross, Georgia for the following analysis based on the previous investigations:

- B16-21 and TMW1-3 – Investigation for metal impacts and delineation of known lead impacts
    - Analysis soil for 8 RCRA metals via EPA method 6010/7471
- B21 – Additionally analyzed at 1.5 feet bgs for TCLP 8 RCRA metals via EPA method 6010/7471

Of the five soil borings, three borings (B18-20) are to be advanced to groundwater via DPT to an anticipated depth of 25 feet bgs and converted to 1-inch diameter PVC temporary monitoring wells (TMW1-3). The three temporary wells will be developed, purged, and sampled after installation. Upon the completion of the sampling activities, the soil sample locations and temporary monitoring wells will be surveyed using a Global Positioning System (GPS) device and tied into a survey outlining the Subject Site's property boundary.

The following table summarizes the sample requirements during the Design Phase Investigation:

Sample Matrix	*Environmental Parameters*	*Sample Collection Method*	*Analytical Method*	*Number of Samples*
Soil	8 RCRA Metals	4 oz jar	EPA 6010/7471	>10
Soil	TCLP 8 RCRA Metals	1 liter jar	EPA 6010/7471	1
Groundwater	8 RCRA Metals	500mL HDPE container	EPA 6010/7471	>3

Field parameters collected in the field are not considered critical beyond demonstration of data quality, or guidance for subsequent sampling. Laboratory analyses are critical in determining if environmental impacts are present at the site, which may require additional delineation or other action.

Excavation Confirmation Sampling

Collection and analysis of soil samples are intended to confirm excavation has been completed to the extent necessary to achieve the required residential RRS goal. The investigations leading to the soil removal action were designed to fully delineate the vertical and horizontal limits of contamination, and therefore minimal confirmatory soil sampling is suggested at this time. However, in some areas soil confirmation will be required to verify the prior sampling results, or to fill in any potential data gaps.

As discussed above, a design phase investigation to further delineate and characterize the site is to occur prior to excavation; however, for the purposes of this report, the COCs and confirmation sampling requirements are anticipate to remain the same. If the results of the design phase investigation indicate otherwise, it will be addressed in a QAPP Addendum.

Confirmation samples will be analyzed for the COCs at the specific excavation areas. Confirmation soil samples will be collected in accordance with Georgia EPD confirmation sampling criteria as outlined in the

Cleanup Work Plan (excerpt included as Appendix E). Specifically, confirmation samples will be collected from each direction (north, south, east, west) at intervals of one per 25 linear feet along the sidewalls of the excavation at the depth previously noted with the highest concentration and from the floor of the excavation on an approximate interval of one per 625 square feet.

The following table summarizes the sample requirements during the Design Phase Investigation:

Sample Matrix	*Environmental Parameters*	*Sample Collection Method*	*Analytical Method*	*Number of Samples*
Soil	Lead	4 oz jar	EPA 6010	>11

At a minimum, 11 soil samples are anticipated to be collected at each of the areas requiring confirmation samples (including five excavation floor and six sidewalls), with additional samples being required for each additional 25 linear feet of sidewall and for each 625 square feet of excavation floor. Please note that sidewalls will only be collected within the confines of the Subject Site, and therefore will not be collected along perimeter sidewalls. Pending analytical results, additional soil samples may be required to further delineate impacted areas.

Any waste generated during this assessment (such as PPE) that may be characterized as hazardous, will be containerized and properly labeled until appropriate analytical tests are conducted to determine its waste characterization. Generated waste will be disposed of in the same way the material handled is disposed of. All management of generated waste will be conducted in accordance with EPA Region 4 SESDPROC-202-R3 SOP.

B2. SAMPLING & ANALYTICAL METHOD REQUIREMENTS

The SOPs associated with soil and groundwater sampling reference below will be adhered to. Links to the SOPs are provided hereafter.

- EPA Region 4 SOP SESDPROC-301-R4 – Groundwater Sampling
  - https://www.epa.gov/sites/production/files/2017-07/documents/groundwater_sampling301_af.r4.pdf
- EPA Region 4 SOP SESDPROC-205-R3 - Field Equipment Cleaning and Decontamination
  - https://www.epa.gov/sites/production/files/2016-01/documents/field_equipment_cleaning_and_decontamination205_af.r3.pdf
- EPA Region 4 SOP SESDPROC-202-R3 – Management of Investigative Derive Waste
  - https://www.epa.gov/sites/production/files/2015-06/documents/Management-of-IDW.pdf
- EPA Region 4 SOP SESDPROC-209-R4 – Packing, Marking, Labeling and Shipping of Environmental and Waste Samples
  - https://www.epa.gov/sites/production/files/2020-06/documents/Shipping-Environmental-and-Waste-Samples.pdf
- EPA Region 4 SOP SESDPROC-300-R3 – Soil Sampling criteria
  - https://www.epa.gov/sites/production/files/2015-06/documents/Soil-Sampling.pdf

The laboratory will provide containers for the samples; pre-preserved when applicable. The Cleanup Project Manager is responsible for ensuring the laboratory provides the appropriate sampling containers. Additionally, the Cleanup Project Manager and their Field Team is responsible for overseeing sample collection activities. Anticipated sample container and preservation requirements are listed in the following

table:

Sample Container and Preservation Requirements

Matrix	Parameter	Method	Container	Preservative	Hold Time	Min. Volume
Soil	Metals	6010/7471	Glass	Ice	180 days	4 oz
Soil	Metals (TCLP)	6010/7471	Glass	Ice	180 days	1 L
Groundwater	Metals	6010/7471	Plastic	Ice/HNO_3	7 days	500 mL

Precautions will be taken to prevent cross-contamination. If the field team encounters any problems or unexpected situations while in the field (e.g., access problems, safety issues, inadequate supplies, equipment failure, etc.), the Cardno Project Manager will be notified and corrective action implemented. Corrective action required during field activities will follow the Corrective Action Flow Chart included as Appendix G.

Any materials generated as a result of cleanup activities may require characterization for waste profiling. Materials, such as disposable personal protection equipment, will be containerized and properly labeled until appropriate analytical tests are conducted to determine its waste characterization. Materials generated on site that are characterized as non-hazardous will be disposed of as non-hazardous waste. Any identified containerized hazardous waste that is stored on site will be manifested and shipped to a permitted treatment and/or disposal facility. All management of waste materials will be conducted in accordance with EPA Region 4 SESDPROC-202-R3 SOP.

B3. SAMPLE HANDLING & CUSTODY REQUIREMENTS

Field and laboratory personnel will be aware, at all times, of the need to properly maintain all samples, whether in the field or in the laboratory, under strict chain of custody protocols and in a manner to retain physical sample properties and chemical composition. The handling and transportation of the samples will be accomplished in a manner that not only protects the integrity of the sample, but also documents sample custody. In general, packing, marking, labeling, and shipping of samples will be conducted in accordance with the SOP: *EPA, Region 4, Field Sampling Procedures: Packing, Marking, Labeling, and Shipping of Environmental and Waste Samples, SESDPROC-209-R4, February 23, 2020*). Samples will be packed and shipped in accordance with applicable and current US Department of Transportation (DOT) regulations and/or International Air Transport Association (IATA) standards. The following sections detail sample handling and custody requirements from sample collection to final delivery to the certified laboratory.

Upon collection, samples will be transferred immediately from the sampling device into appropriate laboratory-supplied containers. All samples collected will have discrete sample identification numbers. The unique sample identifications are necessary to identify and track each of the many samples collected for analysis during the duration of the project. Whenever possible, sample labeling procedures from previous investigations will be followed or continued. Sample collection containers used during field activities will be

labeled with unique sample numbers.

Samples will be packaged in a manner to prevent breakage or cross contamination during shipping. A chain of custody form will be completed for each set of collected samples. The purpose of the COC procedure is to prevent misidentification of samples, prevent tampering of the samples during shipment and storage, allow easy identification of tampering, and allow for easy tracking of possession. If the chain of custody is broken at any time from sample collection through analysis, the respective project manager will be notified.

When collection samples leave the sampler's immediate control (e.g. shipment to laboratory), the sampler will sign and date the chain of custody form(s) to relinquish the samples. The chain of custody form will be placed into a sealable bag. A custody seal will be placed on shipping containers when applicable. The custody seal will bear the collector's name and the date signed. The custody seal is used to ensure that the samples in the shipping container have not been tampered with, therefore ensuring sample integrity. If samples are delivered by the sampler directly to the laboratory, the custody seal may not be used.

B4. ANALYTICAL METHODS AND REQUIREMENTS

The laboratory will conduct analytical analysis for the media provided. Specifically, samples collected under the scope of this project will be submitted for laboratory analysis of constituents as specified in Section B2. Once the samples are received and logged in at the laboratory, the samples will be analyzed as requested on the chain of custody.

Available laboratory information and extraction and digestion criteria are included in Laboratory QAM documents, included in Appendix F. The Laboratory Director is responsible for overseeing the success of the analysis and for implementing corrective actions if deemed necessary as set forth in Section C1 of this document.

Non-standard or unpublished methodologies for analysis are not anticipated. Laboratory analysis will be performed in a standard turn-around time of 10 business days for electronic data and 14 business days for hardcopy.

Constituents of concern, analytical/extraction methods, sample container, preservation, holding time requirements, are provided in the referenced EPA guidance documents.

The detection limit requirements for each analyte are typically below regulatory limits for the parameters of interest. The Cardno Project Manager has reviewed the laboratory QC samples and control limits identified in the laboratory documentation. The quality of the data generated using the laboratory QAM will provide analytical data of a known quality and precision for projects under this Atlanta EPA Brownfield RLF Program.

B5. FIELD QUALITY CONTROL REQUIREMENTS

Quality control in the field will be conducted in accordance with the following SOP: *EPA, Region 4, Quality System Procedures: Field Sampling Quality Control, SESDPROC-011-R4, April 16, 2017.*

A sufficient volume of each sample will be collected in the field to allow for re-analysis if the laboratory data quality objectives are not reached or if additional analyses are required. All consumable equipment used to conduct sampling activities will be single use and dedicated by sample. All reusable equipment will be properly decontaminated prior to collection of additional samples.

Due to the nature of the remediation work, quality control requirements include the following:

Field Duplicate Samples: A field duplicate is a second sample collected at the same location as the original sample and will be used to assess sampling and laboratory precision. Duplicate air samples will be collected simultaneously or in immediate succession, following identical collection procedures, and treated in the same manner during sample shipment, storage, and analysis. The sample containers will be assigned an identification number in the field such that they cannot be identified (blind duplicate) as duplicate samples by laboratory personnel. Field duplicate samples will be collected at a one-to-twenty ratio.

Field Blank Samples: A field blank is a sample that is prepared in the field to evaluate the potential for contamination of a sample by site contaminants from a source not associated with the sample collected. Deionized water is poured into the appropriate sample containers in dusty environments and/or from areas where contamination is suspected as being present in the atmosphere and originating from a source other than the source being sampled. During the life of the project, field blank samples will be collected once during the Design Phase Investigation and once during removal activities.

Trip Blank: Trip blanks are supplied by the designated laboratory and consist of deionized water in a 40-ml vial. The trip blank will remain in each sample cooler along with the investigation samples and will be analyzed for target volatile compounds only. No VOCs are anticipated to be analyzed during this cleanup, so no trip blanks are required.

Equipment Rinsate Samples: The equipment rinsate blank is a sample of deionized water that is prepared in the laboratory, shipped to the site with other sample containers, and poured over the cleaned, decontaminated sample collection equipment in between sample collection. The equipment rinsate blank will be used to evaluate potential cross-contamination that may occur by reusing sample collection equipment if not thoroughly decontaminated between sample collection events. Equipment rinsate blank samples will be collected weekly after equipment is cleaned, and is anticipated to be collected once during the Design Phase Investigation and once during removal activities.

Matrix Spike/Matrix Spike Duplicate (MS/MSD): A MS/MSD is a second sample collected at the same location as the original sample and is spiked with a known concentration of analytes of interest. Duplicate soil samples will be collected simultaneously or in immediate succession, following identical collection procedures, and treated in the same manner during sample shipment, storage, and analysis. The sample containers will be assigned an identification number in the field such that they cannot be identified (blind

duplicate) as duplicate samples by laboratory personnel. MS/MSD samples will be collected at least once during the life of the project.

In summary, the following Field Sampling QC Table will be followed during this cleanup:

QA/QC Sample	Matrix	Parameter	Method	Frequency
Field Duplicate	Soil	8 RCRA Metals	EPA 6010/7471	1 per 20 samples
Temp Blank	Water	Temperature	EPA 170.1	1 per cooler
Field Blank	Water	8 RCRA Metals	EPA 6010/7471	1 per week
Trip Blank	Water	VOCs	EPA 8260	None
Equipment Rinsate Blank	Water	8 RCRA Metals	EPA 6010/7471	1 per week
MS/MSD	Soil	8 RCRA Metals	EPA 6010/7471	1 during life of project

All quality control samples will be submitted for laboratory analysis of the project constituent suite. Chain-of-Custody procedures will be completed as outlined in accordance with SOP: *EPA, Region 4, Quality System Procedures: Field Sampling Quality Control, SESDPROC-011-R4, April 16, 2017.*

B6. LABORATORY QUALITY CONTROL REQUIREMENTS

The following actions will be taken when control limits are exceeded or interferences or dilution problems are encountered or equipment sensitivity problem exists:

- Review data outliers with the laboratory
- Determine if reanalysis or resampling is required
- Flag data in the report and explain
- Indicate whether data can be used (as indicator), relied upon, or must be rejected

Laboratory quality control checks include:

- Laboratory Control Standard
- Laboratory Control Standard Duplicates
- Matrix Spikes
- Matrix Spike Duplicates
- Method Reagent Blanks

Each laboratory has a QC program in place to ensure the reliability and validity of the analysis performed. All analytical methods are documented in laboratory SOPs. Each SOP includes a QC section, which addresses the minimum requirements for the procedure. These SOPs will be presented upon request. The following paragraphs describe the QC samples potentially required for soil samples.

Method Blank: A method blank is a sample of ASTM Type II or organic-free (deionized) water that is carried through each step of the preparation and analytical method. A method blank sample will be prepared and analyzed with each batch of twenty or fewer samples. Method blank samples will be used to assess potential contamination attributed to laboratory operations during sample preparation and analysis.

Instrument Blank: An instrument blank is a sample of ASTM Type II or organic-free (deionized) water that is analyzed with associated calibrations of laboratory instruments. Instrument blank results will be used to assess potential contamination attributed to specific instrument calibration procedures.

Surrogate Spikes: Surrogate spikes are compounds that will be added to every blank, standard, sample, and matrix spike sample as specified in the organic analytical methodology. Surrogate compounds are generally brominated, fluorinated, or isotopically labeled compounds not expected to be in environmental samples. The results of the surrogate spike will be used to evaluate the accuracy of the analytical measurement on a sample-specific basis.

Laboratory Control Samples: Laboratory control samples (LCS) are well-characterized laboratory generated samples used to monitor the laboratory's day-to-day performance of analytical methods. The LCS is a method blank spiked with known concentrations of target analytes. The LCS is carried through each step of the preparation and analytical method. LCS will be reported in %R and used to assess the precision and accuracy of the analytical process independent of matrix effects. Controlling lab operations with LCS (rather than surrogates or matrix spike) offers the advantage of being able to differentiate low recoveries due to procedural errors with those due to matrix effects.

Evaluation criteria for laboratory control samples are dependent upon sample matrix, analytical instrumentation, and analytical method requirements. If required by the method and if sufficient sample volume is available, the laboratory will reanalyze any samples not conforming to QC criteria. It is expected that sufficient sample volumes/weights will be collected to allow for reanalysis when necessary.

Specifically, for this project, the laboratory quality control requirements include the following:

Matrix	Parameter	Method	Laboratory Control Spike (LCS) Range	Relative Percent Different	Matrix Spike (MS) Range	Relative Percent Difference
Soil	Metals	6010/7471	80-120%	20%	75-125%	20%
Ground water	Metals	6010/7471	80-120%	20%	75-125%	20%

Additional laboratory quality documentation is provided in the laboratory QAM included in Appendix F.

B7. FIELD EQUIPMENT AND CORRECTIVE ACTION

An inspection checklist and initial calibration check will be completed by a field team member upon arrival at the site, prior to the commencement of any site sampling activities. A maintenance kit, which will include extra batteries, calibration standards, and commonly needed spare parts, will be made available at the site. Any preventive or corrective maintenance completed will be documented in the field notes. If any equipment fails the initial testing and inspection, a second attempt to calibrate the meter will be performed. If any

equipment fails the second calibration attempt, spare equipment can be obtained from inventory or rented from an environmental sampling supply vendor.

All of the field equipment will be inspected and calibrated before and after each site visit, and after every 8 hours of use. Field equipment calibration log books are maintained for each piece of equipment and project field logs are maintained for each sampling event and given to the Cleanup Project Manager or Field Team Leader upon completion of the sampling event to maintain in the project file for reference. The Cardno Project Manager or QA/QC Officer may request spot checks of equipment calibration at any time. Calibration records can be traced to equipment logs by referencing project specific field notes. Equipment calibrations are completed in accordance with manufacturer specifications.

Corrective action required during field activities will follow the Corrective Action Flow Chart included as Appendix G.

B8. LAB EQUIPMENT AND CORRECTIVE ACTION

The Laboratory QAM addresses the testing, inspection, and maintenance for the analytical instruments and is provided as Appendix F. Procedures include reviewing the instrument log for any notations regarding problems experienced during previous use and verifying that scheduled preventative maintenance has been conducted in accordance with the manufacturer's recommendations. The lab will document any preventative or corrective maintenance conducted on laboratory equipment/instrumentation. The Laboratory Director is responsible for overseeing the testing, inspection, and analytical instruments in accordance with their provided QAM.

B9. ANALYTICAL SENSITIVITY AND PROJECT CRITERIA

Analytical method sensitivity and project criteria for the analytical methods within the scope of this project will be determined by the remedial action goals and with the consideration of the selected laboratory. Minimum detection limits for soil samples will comply with the Georgia Comparison of Existing Contamination to Risk Reduction Standards (Rule 391-3-19.07), and the site-specific residential and non-residential RRS approved by the Georgia EPD in December 2019 as outlined in the Cleanup Work Plan (an excerpt included as Appendix E). The following table provides the required method detection limit and reporting limits:

Matrix	Parameter	Analytical Reporting Limit Range	Analytical Detection Limit Range	Project Criteria
Soil	Metals	1 – 100 ug/Kg	0.0498 – 1.25 ug/Kg	Georgia EPD Type 1 RRS
Ground Water	Metals	0.01 – 1 ug/L	0.00124 – 0.115 ug/L	Georgia EPD Type 1 RRS

B10. DATA MANAGEMENT AND DOCUMENTS

Data for this project will be produced in the following locations:

1. At the jobsite, specifically with ETRI and AquaTerra personnel.
2. With the City of Atlanta Brownfield Program Manager's office located at Atlanta City Hall, 68 Mitchell Street SW, Atlanta, GA 30303.
3. With Cardno's Atlanta office, located at 220 Bay Circle, Suite 220, Norcross, GA 30071.
4. At the AES laboratory, located at 3080 Presidential Drive, Atlanta, GA 30340.

Data collected onsite will be recorded on field data worksheets and into field logbooks, which will become a part of the project file. Prior to submission into the project file, the respective project manager officer will review for accuracy and usability, and submit to the City and the Cardno Project Manager within 14 days of receipt for their review and submittal to the project file.

These documents and records are also maintained in accordance with the requirements set forth in the US EPA Region 4, Science and Ecosystem Support Division (SESD), "*Field Branches Quality System and Technical Procedures*". A sample of some of the required documentation includes the following:

- Field personnel signatures or initials on all records/notes with a waterproof pen.
- Use of field sampling and decontamination supplies and equipment are tracked with an in-house system.
- Sampling containers are prepared by the laboratory and shipped with a packing list documenting contents.
- Preservatives used by the laboratory are traceable by preparation date, vendor, and lot number.
- Sampling containers are pre-cleaned at the laboratory.
- Water level indicator and field parameter meters are cleaned according to specifications and documentation is contained in the field notes.
- All equipment is maintained and calibrated in accordance with manufacturers' specifications.

Field logs will include weather observations at the Subject Site when field activities were conducted. All relevant observations or digressions from the procedures in this QAPP, deemed notable by any field team member, will also be recorded in the field logbook. The Cleanup Project Manager will submit copies of the field data worksheets and logbooks with the field activity report as a periodic deliverable, or as part of the final report.

The laboratory provides electronic copies of the analytical results generally within 14 days of sample receipt. Paper copies will be supplied by the laboratory upon request or will be printed from the electronic copy by the respective project manager. The Cardno Project Manager will ultimately be responsible for reviewing the data to verify its usability, ensuring the analytical report meets requirements, and for forwarding it to the City

of Atlanta and/or EPA Project Officer, when applicable.

After the laboratory report is reviewed, data is then formatted into tables and compared to regulatory limits to determine if contamination is present at the subject property. Upon completion of formatting of the Analytical Data Table, the data will be reviewed for accuracy by the respective project manager. Site figures and maps including analytical results and sample locations may be prepared for submittal with the closeout report. These figures and maps are also reviewed for accuracy by the respective project manager, which will ultimately be reviewed by the Cardno Project Manager. The schedule for the respective project managers to review the data for accuracy and usability will be approximately 14 days after receipt of data. A summary of their findings will be included in the progress reports submitted to Cardno and the City of Atlanta on a weekly basis.

AES will manage the original raw data and data validation report for projects in both hard copy and electronic format. This information will be made available to the respective project manager and Cardno Project Manager upon request. The Laboratory Director/QA/QC Manager will maintain information on where the records are stored and will identify who will be responsible for records management and how long specific types of records or documents will be maintained.

Project records will include all correspondence, field logs and data sheets, laboratory analytical reports, audit findings, waste manifests, progress reports, and a closeout report. Progress reports will be submitted weekly to the City and Cardno, and will include at a minimum the following:

- Activities performed
- Personnel and equipment on-site
- Sampling activities
- Waste removed
- Lessons learned
- Deviations from the Design
- Updated schedule

The following entities will be responsible for various weekly progress reports:

- ETRI will submit to Cardno and the City weekly correspondence summarizing design phase investigation and removal activities, summarization of sampling activities, and waste manifests.
- Cardno will submit to the City weekly correspondence summarizing ETRI and AquaTerra weekly reports, all deliverables, and Davis-Bacon Act compliance documentation.

A closeout report will be submitted to the City and Cardno by the Cleanup Project Manager. This report will include the EPD Compliance Status Report (CSR) from ETRI summarizing cleanup activities and requesting closure with the Georgia EPD. The closeout report will also include copies of field notes and logs, analytical laboratory results, a summary of activities completed with any deviations from the approved QAPP,

conclusions, and recommendations and will be submitted to the Cardno Project Manager, the City, and EPA Region 4 Brownfields Project Officer.

All records and reports and checklist from the USEPA Region 4 Designated Approving Official will be stored in the physical project file located at TCF's main office at 100 Peachtree Street NW, Suite 230, Atlanta, GA. Additional copies will be stored with the City of Atlanta and Cardno's Atlanta office. All records will be made available upon request during the life of the project and for a minimum of three years after the project. The project file will be eventually archived for a minimum period of five (5) years.

Corrective action for detecting and correcting errors in records will follow the Corrective Action Flow Chart included as Appendix G.

C1. ASSESSMENT AND RESPONSE ACTIONS

Any assessment will include soil assessments to determine the general subsurface conditions of the Subject Site, delineation of horizontal and/or vertical extent of contamination, and corrective action.

The verification and validation of all reported data will be conducted by the QA/QC Officer, and QA review of all reports will be conducted by the Cardno Project Manager or similar senior technical staff (as appropriate). The QA/QC Officer may conduct an on-site field audit at the time(s) when samples are being collected for both field and laboratory analysis. The QA/QC Officer will have the authority to halt the on-site work if he/she believes the findings from the audit justify such action. In the event discrepancies are identified during an audit, the QA/QC Officer will discuss findings with the Cardno Project Manager and Cleanup Project Manager. The Cleanup Project Manager will be responsible for corrective actions related to field activities. Audit findings will be included in the final reports. In the event the Cleanup Project Manager hires a subcontractor to perform a specialized task, they will provide oversight of the work by an experienced Field Team Technician, Field Team Leader, or Project Manager.

The laboratory will provide a narrative report with the analytical results referencing the project, associated chain-of-custody, quality control issues, and the validity and integrity of the results. Section D2 of this QAPP discusses the verification and validation process in detail.

Communicating and resolving problems that arise in the field, via corrective actions implementation, will be addressed and overseen by the Project Manager. Corrective action for detecting and correcting errors in records will follow the Corrective Action Flow Chart included as Appendix G.

C2. PROJECT REPORTS

Execution of proposed field activities will not commence until this QAPP is approved by the EPA.

All reports will be reviewed for technical accuracy and data quality by the Cardno Project Manager, QA/QC Officer, or similar senior technical staff (as appropriate). The final report will include a description of project activities, a summary of data, results drawn from the data quality assessment, the field activity reports, details

of any problems encountered during the project and the corrective actions taken, and conclusions from the results and the rationale for those conclusions. The final report will be distributed to the project team and reviewed for conformance with internal document standards. Final reports will be forwarded to the EPA Project Officer, the Atlanta Brownfields Project Manager, and the Georgia EPD Brownfields Coordinator, as applicable.

D1. FIELD DATA EVALUATION

At a minimum, field data will be evaluated in accordance with the following SOP: *EPA, Region 4, Quality System Procedures: Field Sampling Quality Control, SESDPROC-011-R4, April 16, 2017.* The ETRI and Cleanup Project Managers will validate the field data and discuss any problems identified during the project with the Cardno Project Manager. Data will be reviewed for integrity by checking all field entries for errors and consistency. Data validation will be accomplished through a series of checks and reviews intended to assure that the reported results are of a verifiable, reproducible, and acceptable quality.

A data usability review that includes an assessment of field procedures (including field notes, boring logs, field screening results, and field analytical data) completeness, comparability, representativeness, precision, and bias (accuracy) of the data will be performed by the Cleanup Project Manager. The findings of this review will be documented and presented in the final report.

If verification or validation indicates that samples have been collected and/or analyzed out of compliance with the QAPP (for instance deviations from the acceptance criteria for quality control defined in this QAPP and its addendums), resampling may be required. The Cleanup Project Manager must contact the Cardno Project Manager and EPA Project Officer in the event that there are any deviations from the QAPP and the Brownfields EPA Project Officer will determine if the data is acceptable or if resampling is required. If data is accepted that deviates from the QAPP, the data will be used for screening purposes only and annotated as such.

D2. LABORATORY DATA EVALUATION

The Laboratory Director/QA/QC Manager will review and verify the laboratory data generated under their corrective action system for accuracy according to the laboratory's QAM/LQM, as detailed in Section B8 of this document. Quality control checks are performed on field data by reviewing the chain of custody forms and results from the lab for each sampling event. All sample results will be reviewed and correlated to field measurements and observations. The validation process will include:

- Narrative review
- Quality control blanks meet criteria
- Appropriate preservatives were used and hold times were met
- Quality control data (spikes, duplicates) are acceptable
- Surrogate spike recoveries are acceptable

- Unacceptable data are identified and corrective actions are initiated
- Data qualifiers are assigned (by lab) if necessary:

In addition to evaluating data qualifiers associated with laboratory analyses, a comparison of the sample duplicate(s) and the corresponding sample result(s) will be made to evaluate the reproducibility of the sample results based on the laboratory analysis and sample collection and transportation procedures. For this comparison, if the duplicate or sample result is less than five (5) times the reporting limit then the comparison is made by the absolute difference between the results (S-D). If these differences are within two times (2X) the "acceptable" limits, they are considered "slightly high"; anything beyond that would be considered "high". If both sample and duplicate results are greater than five times (5X) the reporting limit (the higher of the two RLs, if they're not the same), then precision is assessed by the %RPD (difference in results divided by the average of the two results X 100); <35% RPD = "good/acceptable", >35% but < 50% = variability is "slightly high", >50% = "high".

Based on the data qualifiers provided by the laboratory, and on the sample/sample duplicate comparison described above; data will be categorized as fully quantified, qualified, or unusable. Unusable data will not be utilized in the project decision process. Raw data will be included in all submitted project reports.

The Cardno Project Manager or QA/QC Officer will perform verification and validation of laboratory data for conformance with the data objectives stated in this QAPP. Data verification will include completeness, correctness, and conformance evaluations. Data validation will be performed to assess the quality and usability of the data generated. Data verification and validation will be performed in accordance with EPA's "*Guidance on Environmental Data Verification and Validation"* (EPA QA/G8), dated November 2002. Results of the data verification and validation, including potential influence on the data quality will be summarized in the final report.

Typical validation activities include the following:

Item	Activity
Data Deliverables and QAPP	Ensure that all required information on sampling and analysis was provided (including planning documents).
Analytes	Ensure that required lists of analytes were reported as specified.
Chain-of-Custody	Examine the traceability of the data from time of sample collection until reporting of data. Examine chain-of-custody records against contract, method, or procedural requirement.
Holding Time	Identify holding time criteria, and either confirm that they were met or document any deviations. Ensure that samples were analyzed within holding times specified in method, procedure, or contract requirements. If holding times were not met, confirm that deviations were documented, that appropriate notifications were made (consistent with procedural

Item	Activity
	requirements), and that approval to proceed was received prior to analysis.
Sample Handling	Ensure that required sample handling, receipt, and storage procedures were followed, and that any deviations were documented.
Sampling Methods and Procedures	Establish that required sampling methods were used and that any deviations were noted. Ensure that the sampling procedures and field measurements met performance criteria and that any deviations were documented.
Analytical Methods and Procedures	Establish that required analytical methods were used and that any deviations were noted. Ensure that the QC samples met performance criteria and that any deviations were documented.
Data Qualifiers	Determine that the laboratory data qualifiers were defined and applied as specified in methods, procedures, or contracts.
Deviations	Determine the impacts of any deviations from sampling or analytical methods and SOPs. Consider the effectiveness and appropriateness of any corrective action.
Sampling Plan	Determine whether the sampling plan was executed as specified (i.e., the number, location, and type of field samples were collected and analyzed as specified in the QAPP).
Sampling Procedures	Evaluate whether sampling procedures were followed with respect to equipment and proper sampling support (e.g., techniques, equipment, decontamination, volume, temperature, preservatives, etc.).
Co-located Field Duplicates	Compare results of collocated field duplicates with criteria Established in the QAPP.
Project Quantitation Limits	Determine that quantitation limits were achieved, as outlined in the QAPP and that the laboratory successfully analyzed a standard at the QL.
Confirmatory Analyses	Evaluate agreement of laboratory results.
Performance Criteria	Evaluate QC data against project-specific performance criteria in the QAPP (i.e., evaluate quality parameters beyond those outlined in the methods.).
Data Qualifiers	Determine that the data qualifiers applied were those specified in the QAPP and that any deviations from specifications were justified.
Validation Report	Summarize deviations from methods, procedures, or contracts. Include qualified data and explanation of all data qualifiers.

D3. DATA USABILITY AND PROJECT VERIFICTION

Analytical data generated in accordance with approved methodologies will be considered definitive and quantitative based on the results and findings of the validation process.

The Cardno Project Manager or QA/QC Officer will validate the field data and discuss any problems identified during the project with the Cleanup Project Manager. Any problems and associated corrective actions will be documented in the field logs and the closeout report. The Cleanup Project Manager will discuss any problems along with proposed corrective actions with the Cardno Project Manager. A copy of the process flow chart is included in Attachment I.

Because data generated with significant deviations from the requirements of the QAPP will be rejected and because of the nature of the work (biased sampling), all data will have the same expected uncertainties and there will be no limitations on data use. The following is a list of considerations for data usability assessment:

Item	Assessment Activity
Data Deliverables and QAPP	Ensure that all necessary information was provided, including but not limited to validation results
Deviations	Determine the impact of deviations on the usability of data.
Sampling Locations, Deviations	Determine if alterations to sample locations continue to satisfy the project objectives.
Chain-of-Custody, Deviation	Establish that any problems with documentation of custody procedures do not prevent the data from being used for the intended purpose.
Holding Times, Deviation	Determine the acceptability of data where holding times were exceeded.
Damaged Samples, Deviation	Determine whether the data from damaged samples are useable. If the data cannot be used, determine whether resampling is necessary.
PT Sample Results, Deviation	Determine if the implications of any unacceptable analytes (as identified by the PT sample results) on the usability of the analytical results. Describe any limitations on the data.
SOPs and Methods, Deviation	Evaluate the impact of deviations from SOPs and specified methods on data quality.
QC Samples	Evaluate the implications of unacceptable QC sample results on the data usability for the associated samples. For example, consider the effects of blank contamination.
Matrix	Evaluate matrix effects (interference or bias).
Meteorological Data and Site Conditions	Evaluate the possible effects of meteorological (e.g., wind, rain, temperature) and site conditions on sample results. Review field reports to identify whether any unusual conditions were presented and how the sampling plan was executed.
Comparability	Ensure that results from different data collection activities achieve an acceptable level of agreement.
Completeness	Evaluate the impact of missing information. Ensure that enough information was obtained for the data to be useable.
Background	Determine if background levels have been adequately established (if appropriate).
Critical Samples	Establish that critical samples and critical target analytes/COCs were collected and analyzed. Determine if the results meet criteria specified in

Item	Assessment Activity
	this QAPP.
Data Restrictions	Describe the exact process for handling data that do not meet PQOs (i.e., when measurement performance criteria are not met). Depending on how those data will be used, specify the restrictions on the use of those data for environmental decision-making.
Usability Decision	Determine if the data can be used to make a specific decision considering the implications of all deviations and corrective action.
Usability Report	Discuss and compare overall precision, accuracy, representativeness, comparability, completeness, and sensitivity for each matrix, analytical group, and concentration level. Describe limitations on the use of the project if criteria for data quality indicators are not met.

Field modifications regarding sampling analysis may be necessary for circumstances such as auger refusal, limited access areas, or when enough sample volume could not be collected for various reasons. Re-sampling may be necessary if results are deemed unacceptable for various reasons such as exceeding laboratory holding times or to confirm previous sampling and/or excavation activities, etc. These variables will be further defined throughout this QAPP based on the specific contaminants of concern. Upon receipt of the laboratory data, the data will be reviewed to verify its usability. Upon determination, data is then formatted into tables and compared to regulatory limits to determine if concentrations of COCs exceed CTLs at the subject property. Upon completion of formatting the Analytical Data Table; data will be reviewed for accuracy by the Cardno QA/QC Officer.

The Cleanup Project Manager, with oversight from the Cardno Project Manager, will evaluate the usability of individual sample results at the parameter level. Analytical results will be evaluated based on sensitivity criteria described through this QAPP. Data limitations will be documented along with how the data should be used. Conclusions and recommendations drawn from all assessment information will be documented in the final report. Site figures and maps including analytical results and sample locations are frequently prepared for submittal with final reports. These figures and maps are also reviewed for accuracy by the Cardno QA/QC Officer.

Usable data will be tabulated and compared to applicable GEPD and EPA target concentrations. Concentrations which exceed these targets will be highlighted for easy identification. The Field QA/QC Officer will compare and review the laboratory data to the table for completeness, correctness, and accuracy. Usable data will be provided on site figures and other graphical representation and will also be reviewed for completeness, correctness, and accuracy.

The Cardno Project Manager will conduct an overall project evaluation using the field and laboratory evaluations, tabular and graphical data presentations, and analytical sensitivity criteria to determine its value in developing the site conceptual model and assist with the decision making process.

LIST OF ABBREVIATIONS

ABCA	Analysis of Brownfields Cleanup Alternatives
AOC	Area of Concern
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
BS	Blank Spike
BSD	Blank Spike Duplicate
BSA	Brownfields Site Assessment
BSRA	Brownfields Site Rehabilitation Agreement
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
C	Celsius
CD	Compact Disc
COC	Contaminants of Concern
CTL	Cleanup Target Levels
DAO	(EPA) Designated Approving Official
DEFT	Decision Error Feasibility Trials
DO	Dissolved Oxygen
DPT	Direct Push Technology
DQO	Data Quality Objective
DRO	Diesel Range Organics
e.g.	exempli gratia - for example
ESA	Environmental Site Assessment
ECD	Electron Capture Device
FID	Flame Ionization Detector
GC	Gas Chromatography
GC-MS	Gas Chromatography – Mass Spectrometry
GIS	Geographic Information Systems
GPS	Global Positioning Satellite
GRO	Gasoline Range Organics
HAZWOPER	Hazardous Waste Operations and Emergency Response
HPLC	High Performance Liquid Chromatography
ICP	Inductively Coupled Plasma
ID	Identification
i.e.	*id est* - that is
ISHB	Inactive Hazardous Sites Branch
IUPAC	International Union of Pure and Applied Chemistry
kg	kilogram
L	Liter
LCS	Laboratory Control Sample
LIMS	Laboratory Information Management System
MCL	Maximum Contaminant Level
MDLs	Method Detection Limits
MIP	Membrane Interface Probe

LIST OF ABBREVIATIONS

mL	Milliliter
MNA	Monitored Natural Attenuation
MTBE	Methyl tert-butyl ether
MW	Monitor Well
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
NC	North Carolina
NCBP	North Carolina Brownfields Program
NELAC	National Environmental Laboratory Accreditation Conference
NCDEQ	North Carolina Department of Environmental Quality
ORP	Oxidation Reduction Potential
OSHA	Occupational Safety and Health Administration
OVA	Organic Vapor Analyzer
PAHs	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated biphenyl
PE	Performance Evaluation
P.E.	Professional Engineer
P.G.	Professional Geologist
PID	Photo-ionization Detector
PQLs	Practical Quantification Limits
QA	Quality Assurance
QAM	Quality Assurance Manual
QAP	Quality Assurance Plan
QAPP	Quality Assurance Project Plan
QC	Quality Control
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RL	Reporting Limit
RPD	Relative Percent Difference
RQAO	Regional Quality Assurance Designated Approving Official
RSC	Regional Screening Levels
SESD	Science and Ecosystem Support Division
SPLP	Synthetic Precipitate Leaching Procedures
SRG	Soil Remediation Goals
SS	Soil Sample
SW	Solid Waste
SVOC	Semi-Volatile Organic Compounds
SOP	Standard Operating Procedure
TAL	Target Analyte List
TCL	Target Compound List

LIST OF ABBREVIATIONS

TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TQM	Total Quality Management
USC	United Soil Classification
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
µg	microgram
ug	microgram
VOC	Volatile Organic Compounds

Appendix A

USEPA Region 4 Brownfields QAPP Review Checklist

USEPA REGION 4 BROWNFIELDS QAPP REVIEW CHECKLIST

QAPP Title: Quality Assurance Project Plan for Brownfields Projects for 0 Paul Avenue Environmental Abatement
Cooperative Agreement Recipient: City of Atlanta, Georgia Revolving Loan Fund
Grant Number: BF 95445109-4
QAPP Preparer: W. Ashton Smithwick
QAPP Date: 05/2020
Transmittal Date: 05/X/2020
DAO Reviewer: Camilla Warren

*This is **not** an exhaustive list of requirements and is not intended as guidance for developing a QAPP. Refer to the Preparation of Quality Assurance Project Plans for EPA Brownfields Projects in the Southeast for comprehensive requirements.

**For DAOs, mark each element in the right-hand column with one of the following abbreviations:
P = Present & Acceptable; **NP** = Not Present; **I** = Incomplete; **NA** = Not Applicable

ELEMENT	Page Number & Paragraph	EPA Use
A1. Title and Approval Sheet	Pg. 1	
Title (Including CAR's name and revision #)	Pg. 1	
Grant Number	Pg. 1	
Name of organization that prepared the QAPP	Pg. 1	
Dated signature of approving officials: printed names, titles, organizations, date, and signatures	Pg. 2	
Other signatures, as needed	Pg. 2	
A2. Table of Contents	Pg. 3	
A3. Distribution List	Pg. 4	
A4. Project/Task Organization	Pg. 4 - 6	
Key individuals, technical disciplines, and responsibilities	Pg. 4 - 6	
Organizational chart/table depicting lines of authority and reporting responsibilities	Appendix A	
A5. Problem Definition/Background	Pg. 6-8	
Clearly state the problem or decision to be resolved	Pg. 7	
Provide historical and background information	Pg. 7	
A6. Project/Task Description	Pg. 8-10	
List measurements to be made	Pg. 8-9	
Cite applicable technical, regulatory, or program-specific quality standards, criteria, and/or objectives	Pg. 8-9	
Note special personnel or equipment requirements	Pg. 8	
Provide work schedule	Pg. 10; Tbl 1	
Note required project and QA records/reports	Pg. 10	
A7. Quality Objectives and Criteria for Measurement Data	Pg. 11	
State project objectives and limits, both qualitatively and quantitatively	Pg. 11	
State and characterize measurement quality objectives to applicable action levels or criteria	Pg. 11	

ELEMENT	Page Number & Paragraph	EPA Use
A8. Special Training /Certification	Pg. 11-12	
State trainings, date of trainings, expirations, and where applicable records are maintained	Pg. 11-12	
A9. Documentation and Records	Pg. 12-15	
List information and records to be included for this project	Pg. 12-15	
State requested lab turnaround time	Pg. 14	
Give retention time and location for records and reports	Pg. 15	
B1. Sampling Process Design and Site Figures	Pg. 15-17	
Type and number of samples required	Pg. 15-17; Pg. 16 Table; Pg. 17 table	
Sampling design and rationale	Pg. 15-17	
Sampling locations and frequency	Pg. 15-17	
Sample matrices	Pg. 15-17; Pg. 16 Table; Pg. 17 Table	
Classification of each measurement parameter as either critical or needed for information only	Pg. 15-17	
Describe/list SOPs used to characterize and dispose of IDW	Pg. 17	
B2. Sampling and Analytical Procedures	Pg. 17-18	
Describe the sampling methods and procedures or cite the specific SOPs to be used to guide the sample collection	Pg. 17	
Describe how problems (lost samples, broken equipment, etc.) will be resolved and documented	Pg. 18	
If SOPs are referenced, include a table listing all field sampling SOPs that will be used. Include the title of SOP, date, revision number and organization that wrote the SOP. Describe any modifications to the SOPs that are necessary for your project.	Pg. 18; Pg. 18 Table	
B3. Sample Handling and Custody	Pg. 18-19	
Sample handling requirements	Pg. 18-19	
Chain-of-custody procedures	Pg. 19	
B4. Analytical Methods and Requirements	Pg. 19	
Identify the extraction, digestion, analytical methodologies to be followed	Pg. 19	
Specify the turnaround time for hardcopy/electronic laboratory data deliverables	Pg. 19	
Provide the laboratory SOPs as appropriate	Pg. 19	
Identify the individual(s) responsible for overseeing the analysis and implementing corrective actions	Pg. 19	
B5. Field Quality Control Requirements	Pg. 19-21	
Design the field QC program that will be routinely performed, and provide a corresponding field sampling QC table in the QAPP	Pg. 19-21; Pg. 21 Table	

ELEMENT	Page Number & Paragraph	EPA Use
Include field duplicate samples for each matrix and parameter, trip blanks for VOC samples, temperature blanks, and QA/QC samples as necessary	Pg. 19-21; Pg. 21 Table	
B6. Laboratory Quality Control Requirements	Pg. 21-22	
Determine the laboratory QC data to be routinely included with the laboratory's data package, and provide a corresponding laboratory analytical QC table.	Pg. 21-22; Pg. 22 Table	
B7. Field Equipment Calibration and Corrective Action	Pg. 22-23	
If contained in SOPs, reference that appendix in this section of the QAPP. Otherwise, provide a field equipment calibration table for the types of field equipment routinely used	Pg. 22-23	
Discuss the corrective actions taken in the field when the control limits are not met	Pg. 22-23	
B8. Laboratory Equipment Calibration and Corrective Action	Pg. 23	
If contained in laboratory SOPs, reference that appendix in this section. Otherwise, provide a laboratory equipment calibration table for each analytical method	Pg. 23	
Note responsible individuals	Pg. 23	
B9. Analytical Sensitivity and Project Criteria	Pg. 23	
Provide an analytical method sensitivity and project criteria table for the analytical methods that will be routinely performed	Pg. 23	
If the laboratory provides only one analytical method limit, note in the table whether it is the MDL or the QL/RL that is being reported	Pg. 23; Pg. 23 Table	
B10. Data Management and Documentation	Pg. 24-26	
Describe standard record-keeping, data storage, and retrieval requirements for digital and hard copies of field data, laboratory data, and manipulated data; Include any checklists used for data management	Pg. 24-26	
Describe the control mechanism for detecting and correcting errors, and ensuring accuracy	Pg. 25	
Include the name, title, and organization of the person(s) responsible for these activities	Pg. 25	
C1. Assessments and Corrective Actions	Pg. 26	
Assessments/oversight that will be performed and frequency	Pg. 26	
The person(s) responsible for performing the assessments/oversight, and where the results will be documented	Pg. 26	
Identify who will receive the assessment/oversight report; who will be responsible for dealing with corrective actions; and follow up on assessments/oversight	Pg. 26	

ELEMENT	Page Number & Paragraph	EPA Use
C2. Project Reports	Pg. 26-27	
Identify the types of reports that will be routinely generated	Pg. 26-27	
Provide a detailed description of the contents of project final reports to establish expectations between report preparer and client	Pg. 26-27	
D1. Field Data Evaluation	Pg. 27	
Describe the final data evaluation process that will be routinely performed on the field data	Pg. 27	
Indicate how the results of the evaluation will be documented, and what will be presented the final report(s). Indicate the position(s) of the person(s) who will be performing the field data evaluation	Pg. 27	
D2. Laboratory Data Evaluation	Pg. 27-29	
Describe the final data evaluation process that will be routinely performed on the laboratory data	Pg. 27-28; Pg. 28-29 Table	
Perform a completeness check of the laboratory data package to ensure it is compliant with the requirements in the QAPP	Pg. 27-28; Pg. 28-29 Table	
Document the presence or absence of any problems with the data, and note any relevant sample data that may be impacted.	Pg. 27-28; Pg. 28-29 Table	
Evaluate the field QC sample results including data qualifiers for sample results	Pg. 27-28; Pg. 28-29 Table	
D3. Evaluating Data in Terms of User Needs	Pg. 29-31	
Describe the overall project evaluation process that will be routinely performed to determine the usability of the data, update the conceptual site model, and determine if the objectives of the project have been met	Pg. 29-30	
Tabulate the field sample data together with the state/federal standards for presentation in the final report	Pg. 30 Table	
Using the summary tables and graphical presentations, evaluate the usability of the individual field sample results at the parameter level. Document any limitations	Pg. 31	
Document observations, trends, anomalies, or data gaps that may exist. Evaluate how the results have impacted the conceptual site model, and if the objectives of the project have been met. Draw conclusions and recommendations from all the information	Pg. 30-31; Pg. 30 Table	

Final QAPP disposition:
___ *Approved, no comments*
___ *Approved with comments, resubmittal **not** required*
___ *Conditionally approved, comments must be addressed, resubmittal required*
___ *Not approved, comments must be addressed, resubmittal required*

References

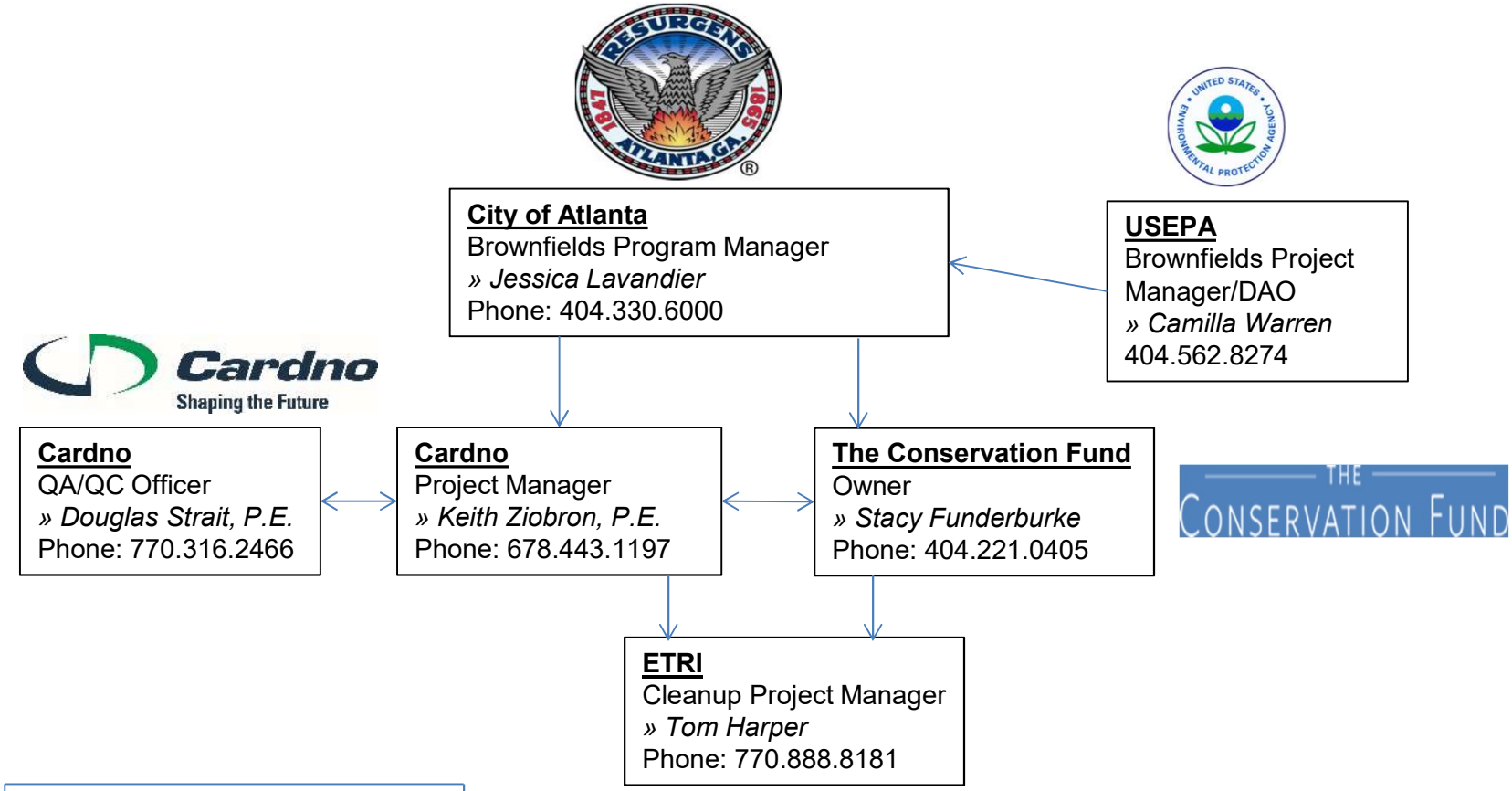
EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, March 2001, EPA/240/B-01/003,

Guidance for Quality Assurance Project Plans, EPA QA/G-5, December 2002, EPA/240/R-02/009
(Available from EPA's Website: http://www.epa.gov/quality)

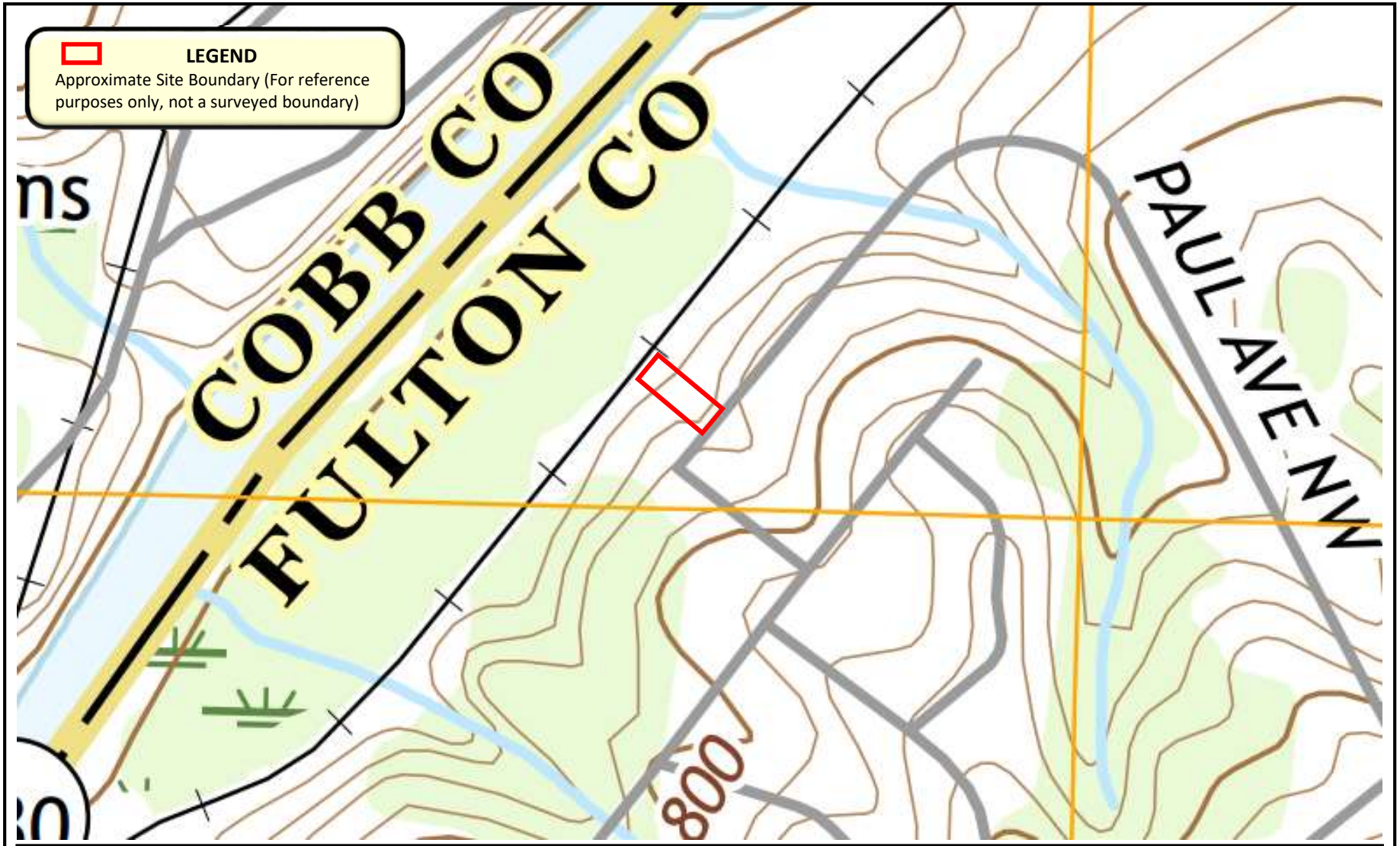
Appendix B

Project Organizational Chart

Quality Assurance Project Organizational Chart



Appendix C
Figures



Cardno
Shaping the Future

Quality Assurance Project Plan
0 Paul Avenue
Fulton County, Atlanta, GA
Cardno Project: 0002421001

Figure 1
USGS/Site Vicinity Map
Source: USGS 2017

Cardno
Shaping the Future

"This is not a map of survey."

Quality Assurance Project Plan
0 Paul Avenue
Fulton County, Atlanta, GA
Cardno Project: 0002421001

Figure 2
Tax Map

Source: Fulton County GIS

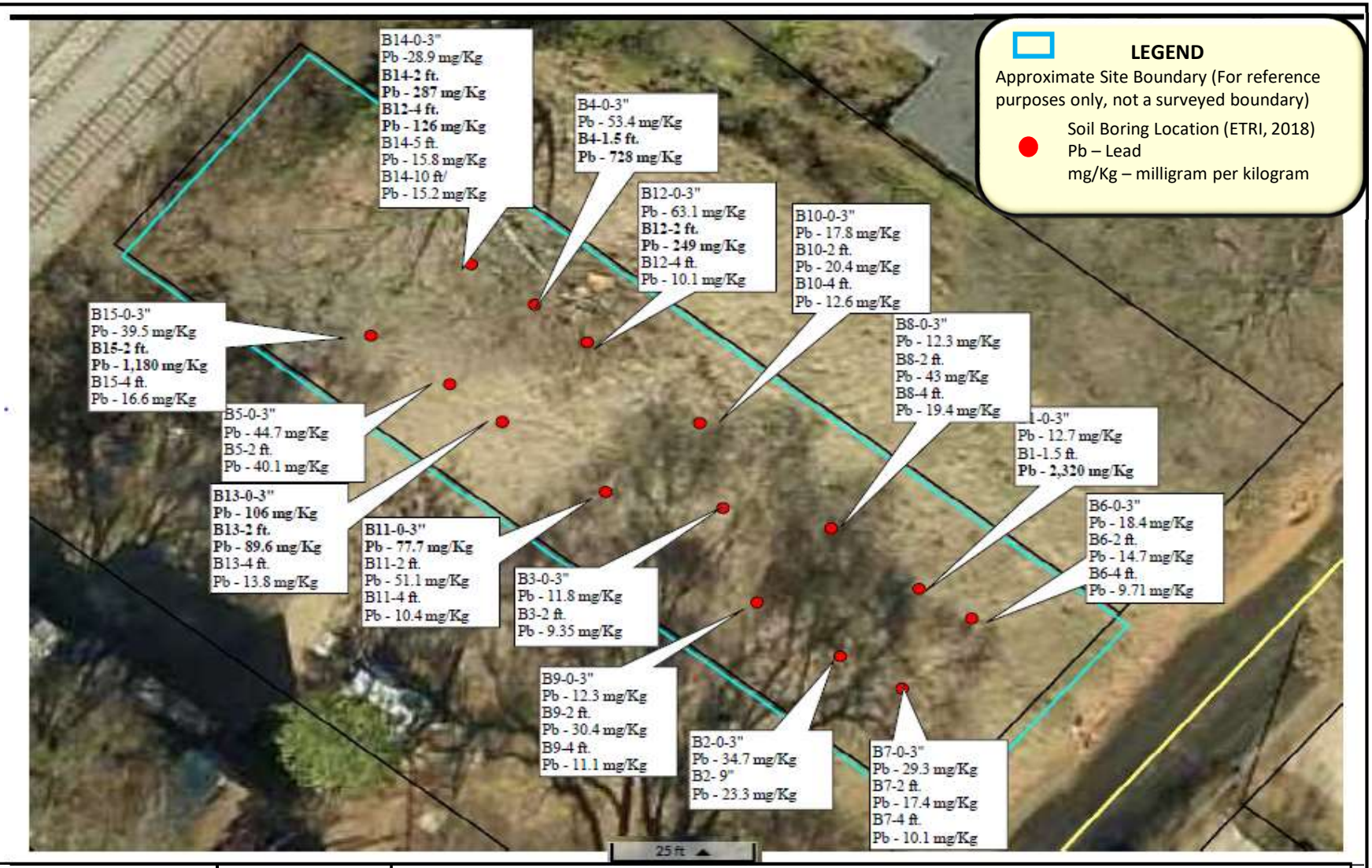


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Figure 3
Soil Sampling Location
Source: ETRI PPCAP, September 2019

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Figure 3
Proposed Additional Sampling Locations

Source: ETRI Proposal, April 2019

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Figure 5
Estimated Soil Excavation Area
Source: GoogleEarth