Quality Assurance Project Plan

EPA Brownfields Cleanup Grant – Region 7
City of Clinton, Iowa
Cooperative Agreement Number: 4B96705601

1000 Block of South 4th Street Project

Air Sampling During Building Demolition and Building Debris Removal and UST Removal

1000, 1002, 1004, 1006 – 1008, and 1010 – 1012 South 4th Street
Clinton, Iowa

Prepared for:
United States Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

And

City of Clinton
611 South 3rd Street
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Prepared by:

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Revision No: 0
Date: October 16, 2023

Approvals Signature:

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_____ Date: October 16, 2023
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Brownfields Project Officer

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Diane Harris
Region 7 Quality Assurance Manager

TABLE OF CONTENTS

ACRONYMS

ABCA	Analysis of Brownfields Cleanup Alternatives
ACM	Asbestos Containing Materials
BS	blank spike
BSD	blank spike duplicate
COC	Chain of Custody
City	City of Clinton
CFR	Code of Federal Regulations
DQA	data quality assessment
DQO	data quality objectives
ESA	Environmental Site Assessment
eV	electron volts
IAC	Iowa Administrative Code
I.D.	identification
IDNR	Iowa Department of Natural Resources
f/cc	fiber per cubic centimeter
GPS	Global Positioning System
LCS	laboratory control samples
MCEF	mixed cellulose ester filter
MDL	method detection limit
mg/kg	milligrams per kilogram
ml	milliliter
mm	millimeter
MS	matrix spike
MSD	matrix spike duplicate
NIOSH	National Institute of Occupational Safety and Health
NVLAP	National Voluntary Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
oz	ounce
PARCCS	precision, accuracy, representativeness, comparability, completeness, and sensitivity
PCM	Phase Contrast Microscopy
PE	performance evaluation
PELs	permissible exposure limits
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
RACM	Regulated Asbestos Containing Materials
RL	reporting limit
RPD	relative percent difference
RSD	relative standard deviation
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control

SOPs	Standard Operating Procedures
TWA	Time-weighted Average
U.S. EPA	United States Environmental Protection Agency
µg/L	microgram per liter
µm	micrometer
VOCs	volatile organic compounds

1.0 PROJECT MANAGEMENT

1.1 Title and Approval Page – See pages 1 and 2

1.2 Table of Contents – See pages 3 through 6

1.3 Distribution List

The following individuals and their respective organizations will receive a finalized and signed QAPP approved by the EPA.

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1.4 Project Organization

Representing the City of Clinton (City) is Ms. Tammy Johnson, Project Director/Manager. Ms. Johnson is charged with directing project activities, approving final documents, and coordinating efforts between the consultant, state, and federal reviewers.

The EPA Brownfields Project Officer, Ms. Jennifer Morris, is the point of contact for the Cleanup Grant. The Brownfields Project Officer is responsible for reviewing and providing comments on the QAPP, responding to questions regarding the grant process, and other project submittals.

The Project Manager for Blackstone is Ms. Krista Brodersen. Ms. Brodersen oversees the consultant activities for the Project including planning, monitoring, and evaluating project field activities; resolving technical issues and providing guidance; and reviewing reports and documents. Ms. Brodersen reports to the City's Project Director/Manager.

The Quality Assurance Reviewer for Blackstone is Ms. Lindsay James. Ms. James will perform QA/QC audits, check and assist in document and project reviews relative to the project plan, and review the QAPP annually for updates.

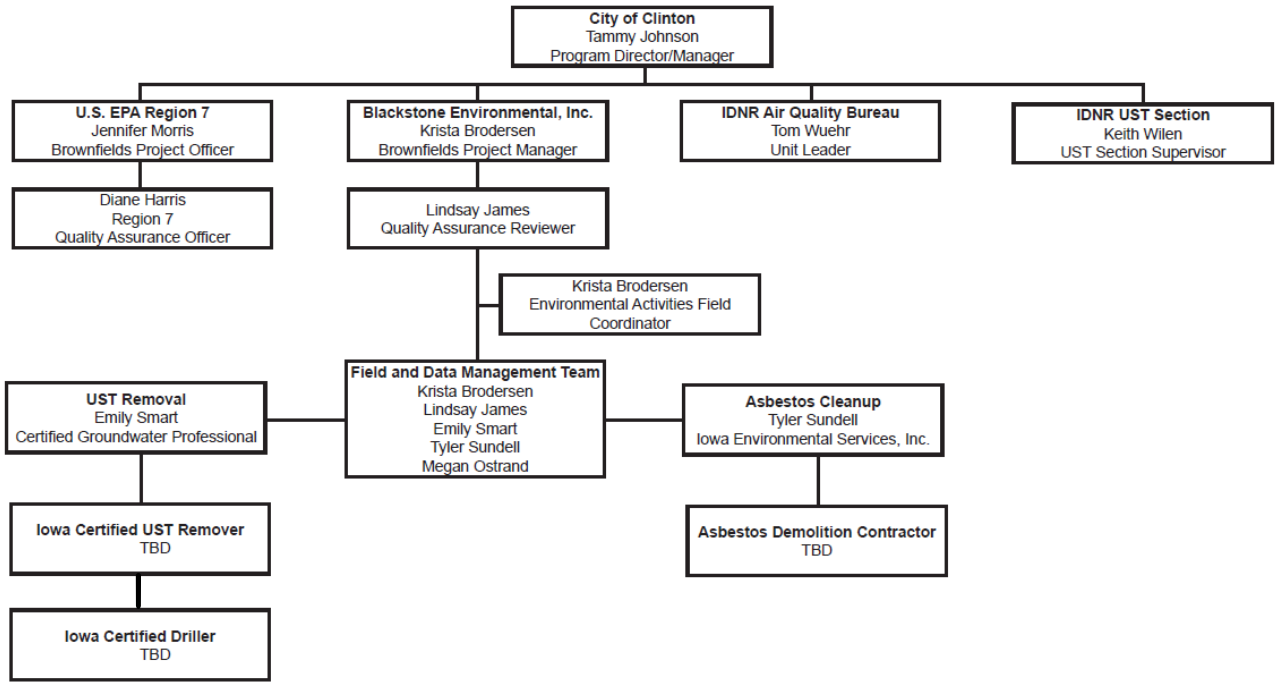
Cleanup activities and evaluation are overseen by the Blackstone Field Activities Coordinator, Ms. Brodersen. Ms. Brodersen will oversee cleanup activities, other Blackstone employees, and subcontractors who perform the cleanup activities on the Project. Ms. Brodersen will coordinate cleanup activities involving asbestos, UST removal, the analytical laboratory, and asbestos and UST removal contractors who hold necessary state and federal certifications and licenses to complete work planned on the Project. Cates Laboratory and Iowa Environmental Services, Inc. will perform the transmission electron microscopy analysis of the air samples collected. Teklab, Inc. will perform the analysis of soil and groundwater samples collected during the UST removal. An Iowa licensed UST Remover will perform the UST removal. The Iowa licensed UST Remover will be subcontracted by Blackstone. An Iowa certified asbestos demolition contractor will perform the demolition and debris removal. The Iowa certified asbestos demolition contractor will be obtained through proper procurement procedures and will be determined prior to the start of field activities.

The IDNR Air Quality Bureau oversees asbestos abatement and removal. Mr. Tom Wuehr, Unit Leader, will provide project oversight and guidance related to the asbestos cleanup portion of the project.

If an UST is identified on the Site, Ms. Emily Smart will act as the Iowa Certified Groundwater Professional and oversee the sampling of the soil and groundwater after the UST removal.

The IDNR UST Division will provide oversight if an UST is identified on the Site. Mr. Keith Wilken, UST Section Supervisor, will provide project oversight and guidance related to the UST removal portion of the project.

See Figure 1-1. Organization Chart



1.5 Problem Definition/Background

1.5.1 Problem Definition

The primary objective of the Project is to design and implement the cleanup of the 1000 Block of South 4th Street site. The project site is located at 1000, 1002, 1004, 1006 – 1008, and 1010 – 1012 South 4th Street (Site) in Clinton, Iowa (refer to figures in Section 7.0). To meet the primary objective, activities to be conducted include the demolition of a dilapidated building and removal of a debris pile comprised of materials associated with the collapsed and demolished buildings that contain asbestos in accordance with Federal and State requirements.

The secondary objective of the Project is to assess if an UST is present under the basement if the 1000 South 4th Street building. If an UST is present, activities to be conducted include the removal and disposal of the UST and impacted soil if found in accordance with Federal and State requirements.

This QAPP is intended to provide an overview of EPA Brownfields Cleanup activities to be performed in support of the City's effort to cleanup the Site and to help ensure the reliability of data generated from those activities.

1.5.2 Project Background

The Site consists of five 2- and 3-story brick buildings constructed between 1868 and 1912 that were used for retail purposes on the first floor and residential apartments on the second and third floors. Retail occupants have included a grocery, laundromat, hardware store, resale shop, upholstery store, furniture and antique store, used clothing store, offices, barber shop, drug store, restaurants, taverns, and a meeting hall. The buildings are currently vacant and have been for up to a decade. They are in disrepair, having been occupied by squatters for years, and are structurally unsafe with sagging roofs and unstable floors. The City has secured the buildings by boarding windows and doors.

Based on the age of the buildings, it is assumed ACM are present. An ACM inspection was conducted on the building located at 1010 – 1012 South 4th Street in 2022 that identified roofing materials, floor tile, and linoleum as ACM. The south and southwest portions of the second and third floors were not able to be inspected due to severe deterioration of the structure. Due to the state of the remaining buildings (severe disrepair and unsafe to enter), ACM inspection has not been conducted.

Evidence of a suspected UST was observed in the basement of the 1000 South 4th Street building in the form of a vent pipe. Based on the suspected location in the floor of the basement, the suspected UST is presumed to be a former heating oil UST. There was limited access to the basement and the UST and its presence has not been verified. It is possible that the UST is still located beneath the basement of the 1000 South 4th Street building.

The buildings addressed as 1000, 1002, 1004, and 1006 - 1008 South 4th Street comprise the North Building Block. The buildings are connected and share common walls between each. The property located at 1000 South 4th Street was quit claimed to the City in 2023 under proper due diligence practices. The property located at 1002 South 4th Street was acquired by the City in 2019 through tax sale. The City purchased the building located at 1004 South 4th Street in 2020 due to the dilapidated condition. Due diligence was not conducted prior to purchase. The 1006 - 1008 South 4th Street building was acquired in 2021 by the City under Iowa Code 657A – Abandoned or Unsafe Buildings. The property located at 1010 - 1012 South 4th Street was acquired by the City in 2019 through tax sale. The building addressed as 1010 - 1012 South 4th Street comprises the South Building Block and was acquired by the City in 2019 due to unpaid taxes. This building is severely deteriorated and has been deemed unsafe to enter and structurally unsound.

On August 11, 2023, the building located at 1006 – 1008 South 4th Street collapsed. Building materials (bricks) from the collapse were strewn into South 4th Street (Lincoln Highway). The same evening, Crandal Excavating, a contractor hired by the City of Clinton, removed the debris on South 4th Street and placed it in the collapsed area. The contractor also pushed in three of the remaining walls of the building to prevent further collapse. The wall connected to the 1004 South 4th Street building was left standing. In a letter dated August 15, 2023, a structural engineer from Willett Hofman & Associates Inc. indicated the collapsed building posed a significant threat to the structural integrity of the connected buildings located at 1000, 1002, and 1004 South 4th Street and recommended they be demolished to a level where a collapse would not allow debris to land on the roadway.

Based on the engineer's recommendation, the structures located at 1000, 1002, and 1004 South 4th Street were demolished to a level where a collapse would not allow debris to land on the roadway and possibly do harm to the public. The demolition was conducted from August 28 through 30, 2023 and was conducted by Lawson Rigging and Excavating, a contractor hired by the City of Clinton, that was overseen by a certified asbestos abatement contractor. The demolition was conducted under wet conditions. The building materials from the four buildings were stockpiled on Site and covered with plastic. Air monitoring for asbestos was conducted during the demolition and periodic air monitoring has been conducted since the demolition. Periodic air monitoring will be conducted until the debris pile can be removed. It is planned that the 1010 – 1012 South 4th Street building be demolished when the debris pile is removed.

1.6 Project/Task Description and Schedule

This QAPP covers activities associated with the cleanup of the Site performed by the City and its consultants pursuant to the Small Business Liability Relief and Brownfields Revitalization Act of 2002. The cleanup activities addressed in this QAPP will be pursuant to:

- Title 29, CFR, Sections 1910.120, 1910.1101, 1910.134, 1910.2, 1910.1200, and 1926.58. OSHA, U.S. Department of Labor.
- Title 40, CFR, Part 61, Subparts A and M, National Emission Standards for Hazardous Air Pollutants, U.S. EPA.
- Title 40, CFR, Part 763, Subparts E and G, Asbestos Abatement Project.
- Chapter 88B of the Code of Iowa, Removal or Encapsulation of Asbestos.
- Chapter 81 of the IAC, Asbestos Control Procedures, Iowa Bureau of Labor.
- Iowa Bureau of Labor Guidelines for removal of non-friable ACM, e.g., floor tile, roofing, etc.
- IAC 567, 455B, Jurisdiction of Department of Natural Resources.
- IAC 567, 455B, Chapter 133, Rules for Determining Cleanup Actions and Responsible Parties.
- IAC 567, 455B, Chapter 134, UST Licensing and Certification Programs.
- IAC 567, 455B, Chapter 135, Technical Standards and Corrective Action Requirements for Owners and Operators of USTs.

It is the purpose of the QAPP to provide a program of decision that produces data of sufficient quantity and quality to determine whether airborne concentrations of asbestos are present during storage of the stockpile and demolition of the buildings and determine if the possible UST has impacted soil and groundwater beneath the Site.

This QAPP is in effect for the duration of the Cleanup Grant project period as indicated on the signature page. The Blackstone QA Reviewer will review the QAPP periodically during this time for applicability.

1.6.1 Task Description

The project will consist of demolishing the building located at 1010 – 1012 South 4th Street as RACM and the removal of the stockpiled collapsed and demolished buildings formerly located at 1000, 1002, 1004, and 1006 – 1008 South 4th Street. Once the stockpile and concrete basement floor is removed, if an UST is identified, it will be removed along with identified impacted soil.

Prior to the start of field activities, caution signs will be posted on fencing surrounding the Site that meet the specifications of OSHA 29 CFR 1910.1101 where airborne concentrations of asbestos may exceed ambient background levels. Signs will be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure.

The demolition of the 1010 – 1012 South 4th Street Building and removal of debris from the collapsed and demolished buildings located at 1000, 1002, 1004, and 1006 – 1008 South 4th Street will be conducted using heavy equipment only. The activities will include the following:

- Use of one or more excavators, front-end loaders, or similar heavy equipment and dump trucks to remove the debris.
- Thoroughly and adequately wetting the debris pile and structure using fire hydrant water applied with a variable rate nozzle prior to and during debris loading and building demolition. A water meter (or equivalent device) will be installed at the water hydrant to measure the volume of water used during the activities. The water will be delivered as a mist or concentrated stream. The demolition debris will be adequately wet at all times and kept wet during handling and loading into containers for transport to a licensed disposal site.
- Direct high-pressure water impact of ACM will be prohibited. A minimal to moderate amount of water runoff is expected. Best Management Practices will be used to control water runoff and collect storm water on the Site. Storm drain inlet protection will be used in conjunction with on-site controls (such as natural and manmade drainage channels), as necessary.
- All materials will be treated as asbestos-contaminated waste. The RACM debris will be transported to a licensed disposal site in lined and covered containers. Waste load out containers shall be lined with two layers of six mil polyethylene sheeting secured with tape for transport to the landfill.
- Grading of the Site for future use.

Air monitoring will be conducted during the field activities to assess concentrations of asbestos in the air. An initial exposure and negative exposure assessment will be conducted by a competent person (Iowa certified asbestos professional). The initial exposure assessment will be conducted by the competent person (abatement contractor) before or at the initiation of the field activities to ascertain expected exposures during debris removal and building demolition. The results of initial exposure monitoring from breathing zone air samples will be representative of the 8-hour TWA and 30-minute short-term exposures of each employee covering operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

A negative exposure assessment will also be conducted to demonstrate that employee exposure during an operation is consistently below the PEL. For any one specific asbestos job which will be performed by employees who have been trained in compliance with the standard, the employer may demonstrate that employee exposures will be below the PELs by data which conform to the following criteria.

Air monitoring will be conducted daily during removal activities. Air sampling monitors will be placed every approximately 200 feet along the fence line surrounding the Site. Exposure monitoring will also be conducted for each job classification in the work area for a full shift.

The air samples will be analyzed for PCM by NIOSH 7400 by Cates Laboratory and/or Iowa Environmental Services, Inc.

A report will be prepared documenting the emergency demolition, sampling during and after the emergency demolition, building demolition, debris removal, sampling during the demolition and debris removal, data/validation/evaluation, disposal (including waste tickets), and maps.

If an UST is discovered after the removal of the debris and concrete basement floor at the 1000 South 4th Street building, removal of the UST will be conducted. Testing of the contents of the UST will be conducted to identify the contents. If the UST is identified and is determined to contain petroleum products other than heating oil, the UST will need to be registered with the IDNR. Whether or not the UST is required to be registered, IDNR Form 542-1308, Notification of Tank Closure or Change-in-Service, will be completed and submitted to the IDNR UST Section. This form would need to be submitted at least 30 days prior to starting UST closure activities.

The field activities for the UST removal will include the following:

- Testing of contents of the UST.
- One or more excavators, front-end loaders, or similar heavy equipment and dump trucks will be used to uncover and remove the UST as well as collecting soil samples and disposing of the UST and identified impacted soil.
- The UST will be transported to a licensed disposal site.
- Liquids from the UST, sludge, and cleaning fluids will be transported to a licensed disposal site.
- Impacted soil, if identified, will be transported to a licensed disposal site. Waste loads will be covered or tarped for transport to the landfill.
- Geoprobe drilling to collect a groundwater sample.
- Grading of the Site for future use.

The UST removal will be conducted by an Iowa Certified UST Contractor. The removal and sampling associated with the removal will be provided by or directly supervised by an Iowa licensed Certified Groundwater Professional.

The soil and groundwater samples will be analyzed for BTEX and TEH by Iowa Methods OA-1 and OA-2, respectively by Teklab, Inc.

A report will be prepared documenting the UST removal, sampling conducted, data/validation/evaluation, disposal of UST and soils (including waste tickets), and maps.

1.6.2 Schedule

The tentative project schedule is presented below. The major activities are listed sequentially, and the expected duration of each activity is presented.

Task	October 2023	November 2023	December 2023	January 2024	February 2024
QAPP Development					
Building Demolition and Debris Removal					
Air Sampling					
Analytical Results/ Data Evaluation					
UST Removal					
Report					

1.7 Quality Objectives and Criteria for Measurement Data

The quality objective of this project is to implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide data that will lead to the development of scientifically valid conclusions in the final report. Specific procedures for sampling, chain-of-custody, laboratory analysis, field and laboratory audits, preventive maintenance of field equipment, and corrective actions are described in other sections of this QAPP.

1.7.1 Objectives and Project Decisions

The primary objective is to remove the risk of exposure of asbestos to the public and the environment from the dilapidated buildings and debris from the collapsed and demolished buildings. The sampling will determine if concentrations of airborne asbestos are present during the building demolition and debris removal. If asbestos is identified in air samples, measurements will be taken to reduce the concentrations.

The secondary objective of the Project is to remove the risk of exposure from a leak from a suspected UST under the basement of the 1000 South 4th Street building. The sampling will determine if concentrations of chemicals of concern are present in soil and groundwater beneath the Site from the suspected UST. Decisions to be made with the data include:

- If the UST is regulated by the IDNR.
- If the data is found to exceed IDNR standards, the release will be reported to the IDNR.
- If the data is found to exceed IDNR standards, the impacted soil will be removed.

1.7.2 Action Limits/Levels

Data generated under this QAPP should be scientifically sound, defensible, and of known, acceptable, documented quality to support project decisions.

The data requirements for this project encompass field sampling, laboratory analysis, and database management to reduce sources of errors and uncertainty in the use of the data. Methods and procedures described in this document are intended to reduce the magnitude of measurement error sources and frequency of occurrence. DQOs include the following:

- Use of standardized, repeatable sample collection procedures.
- Use of trained scientists to perform the sample collection and analyses.
- Calibration of measurement equipment.
- Analysis of duplicate samples.
- Use of Chains-of-Custody when transferring samples or sample material between Blackstone and outside laboratories or experts.
- A QA/QC check on a percentage of samples.
- Maintenance of data.

For data collected under this QAPP to support the DQOs identified above, the DQI, identified below, must be of sufficient quality to provide a high level of confidence in the resulting decisions.

DQIs are qualitative and quantitative statements that clarify the intended use of the data, define the type of data needed to support the decision, identify the conditions under which the data should be collected, and specify tolerable limits on the probability of decision error because of uncertainty in the data. To ensure the collection of high-quality data, specific DQIs have been established for laboratory and field analytical procedures on a method basis for precision, accuracy, representativeness, comparability, completeness, and sensitivity.

The investigation will not be considered invalid if the criteria are not fully achieved, but variances will trigger QA/QC measures to evaluate, and correct, if necessary, identified problem areas.

1.7.1 Quantitative Data Quality Indicators and Determination Methodologies

1.7.1.1 Precision

Precision measures the agreement among a set of replicate measurements. Field precision is assessed through the collection and analysis of field duplicates. Laboratory analytical precision is estimated by comparing the results of split samples, duplicate samples, and duplicate spike samples. The most used estimates of precision are the RSD and, when only two samples are available, the relative percent difference (RPD).

The formula for calculating RPD is as follows:

$$RPD = \frac{|S - D|}{\frac{(S + D)}{2}} x100$$

where:
S = first sample value (original sample value); and
D = second sample value (duplicate sample value).

For field sampling, precision is increased by following SOPs and by collecting samples using the same sampling procedures. Field QC samples collected to measure precision include field duplicate samples (i.e., transport and field handling bias) and include collocated samples (i.e., sampling and measurement precision). Field measurement precision is monitored by taking duplicate measurements at a frequency of 10% of the samples collected and is increased through proper operation and maintenance of field equipment.

Precision for field work is evaluated by calculating the RPD between the results for the field duplicate samples. RPDs will only be calculated for results which are detected at a value greater than 5x the reporting limit. A RPD goal of +/- 50% for soils and +/- 35% for aqueous samples will be used for both field and lab analyses and will be included in the task assignment.

If RPDs greater than 50% for soil samples and 35% for aqueous samples are encountered, corrective action procedures will be implemented. Corrective actions would include evaluation of the sampling procedures, inspection of the sample matrix, and review of field screening results. Laboratory quality control statistics will be calculated per methods specified in Teklab, Inc.'s Quality Assurance/Quality Control Manual (Appendix A).

For the asbestos air samples, precision is dependent upon the total number of fibers counted and the uniformity of the fiber distribution on the filter. A general rule is to count at least 20 and not more than 100 fields. The count is discontinued when 100 fibers are counted, provided that 20 fields have already been counted. Counting more than 100 fibers results in only a small gain in precision. As the total count drops below 10 fibers, an accelerated loss of precision is noted.

1.7.1.2 Accuracy

Accuracy is the closeness of a measured result to an accepted reference value. Accuracy is usually measured as a percent recovery. QC analyses used to measure accuracy include standard recoveries, laboratory control samples, spiked samples, and surrogates.

At this time, there is no known method to determine the absolute accuracy of the asbestos analysis.

For the soil and groundwater samples, overall analytical accuracy is assessed on a batch-specific basis by evaluating the percent recovery (%R) of known concentrations for each analyte in the LCS (and LCSD) against the QC limits. The formula for calculating percent recovery is as follows:

$$\%\ R = \frac{A - B}{C}\ x\ 100$$

where:
A = the analyte concentration determined experimentally from the spiked sample;
B = the background level determined by a separate analysis of the unspiked sample (for calibration standards, LCSs, and surrogate compounds, the value of this term is zero); and
C = the amount of the spike added.

Accuracy is also determined by the analysis of reference material and comparison of the resulting value to that of the accepted value. The difference between the accepted and reference value is the percent difference (%D). The percent difference is calculated as follows:

$$\%\ D = \frac{A - B}{A}\ x\ 100$$

where:
A = the original quantity measured, and
B = the comparison quantity measured.

Field blanks may be used to evaluate the purity of sample containers and chemical preservatives. In most cases, one field blank per sampling event will be sufficient. No other measures will be taken to evaluate accuracy that are directly associated with sampling and field procedures. For samples analyzed by an accredited analytical laboratory, accuracy will be assessed and evaluated by Teklab, Inc.'s personnel in accordance with their Quality Assurance Manual.

1.7.1.3 Completeness

Completeness is a measure of the amount of valid data collected compared to the amount planned. Measurements are considered to be valid if they are unqualified or qualified as estimated data during validation. Field completeness is a measure of the number of samples collected versus the number of samples planned. The formula for calculating sampling completeness is as follows:

$$Field\ Completeness = \frac{Number\ of\ Data\ Points\ Obtained}{Number\ of\ Planned\ Data\ Points}\ x\ 100$$

Analytical completeness is defined as the percentage of valid (nonrejected) analytical results obtained from measurement systems compared with the total number of analytical results requested. The formula for calculating analytical completeness is as follows:

$$Analytical\ Completeness = \frac{Number\ of\ Acceptable\ Laboratory\ Measurements}{Number\ of\ Laboratory\ Measurements\ Reported}\ x\ 100$$

For a set of data to be used with confidence, the data must be complete (i.e., there must be enough valid data from analyses to support the decision). An integral part of obtaining adequate valid data will be to design the sampling network in such a manner that enough data are obtained to enable Site decisions to be made, even if some of the data are determined to be invalid or cannot be collected due to unexpected field conditions. If an adequate degree of completeness is represented by the data set allowing Site decisions to be made, as determined by the Blackstone Project Manager, the data will be considered complete.

Sampling will be considered complete if an adequate degree of completeness is represented by the data set allowing site decisions to be made, as determined by the Blackstone Project Manager. Sampling will be considered accurate if ninety-five percent (95%) of sampling protocols stipulated were used and documentation supports proper use.

1.7.1.4 Sensitivity

Sensitivity is defined as the capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest.

At this time, there is no known method to determine sensitivity of the asbestos analysis.

For the soil and groundwater samples, the MDL is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99 percent level of confidence. At the MDL, the false positive rate (Type I error) is 1 percent. MDLs are specific to an individual determination performed at an individual laboratory.

The RL is the lowest concentration that produces a quantitative result within specified limits of precision and bias. Detected analytical results with quantitation at or above the MDL but below the RL will be reported as detections by the laboratory with the qualification “J.” Detected analytical results at or above the RL will be reported without qualification unless affected by a QC issue.

Detection and quantification limits for sample data must be below the action levels specified in the EPA and State methods. When the list contains more than one action level, the lowest level is chosen. Sensitivity can be affected by contamination as reflected in the method blank results. High method blank

results are cause for reruns in sample preparation or sample analysis. Method detection limits for laboratory analyses are specified in the laboratory's Quality Assurance Manual (Appendix A).

1.7.2 Qualitative Data Quality Indicators and Determination Methodologies

1.7.2.1 Representativeness

Sample representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. It is dependent on the proper design of the sampling program and will be satisfied by ensuring the approved plans were followed during sampling and analysis.

Although representativeness is a qualitative measurement, it is evaluated through a multistep process beginning with evaluation of precision and accuracy data. Project design is one of the critical inputs that determine if the data collected is representative of the population sampled:

- Representativeness of individual samples will be controlled by sample collection and handling in accordance with the project requirements:
  - The sample containers and preservation methods will be used to ensure that samples arriving at the laboratory retain the appropriate degree of representativeness.
  - Meeting required holding times ensures that samples retain representativeness at the time of extraction and analysis.
- Representativeness will also be assessed using field and laboratory blank samples to help determine if compounds detected in the environmental samples are Site-related or have been introduced through shipping, storage, field procedures, or laboratory procedures.
  - A method blank will be analyzed with every analytical or preparation batch (as appropriate to the analytical method) to determine potential contamination introduced during routine laboratory procedures.
  - Initial calibration blanks and continuing calibration blanks will be analyzed, as required, by analytical methods.
  - Equipment blanks will be collected for soil and groundwater samples to assess potential contamination due to field conditions.

Samples will be collected in such a manner (and at suitable locations) to accurately reflect the concentrations in the media from which they were collected at the time of sampling. Sample or measurement locations may be biased (judgmental) or unbiased (random or systematic), depending on the desired data use. Representativeness of the data is partially ensured by avoiding cross-contamination, adherence to standard sample handling and analysis procedures, and use of proper chain-of-custody and documentation procedures. Representativeness may be assessed by comparing repeated analysis from the same sampling point over a period of time.

1.7.2.2 Comparability

Comparability expresses the degree of confidence with which one data set can be compared to another. Data is comparable if Site considerations; collection techniques; and measurement procedures, methods, and sensitivity limits are equivalent for the samples within a sample set.

For this project, comparability will be satisfied by ensuring that the approved plans are followed, and that proper sampling and analysis techniques are applied. The sampling plans that will be implemented for this project are based on approved and established protocols.

Summaries of the QA/QC objectives for the analysis and collection of samples for this project are provided in subsequent narrative and tables. The specific DQIs associated with each subtask (asbestos analysis, soil samples, and groundwater samples) are presented in the method-specific sections. For each DQI, the procedures to be followed to provide assurance that an analytical procedure is returning valid results are provided. Each DQI has a specific result that must be met before the data are considered acceptable. Maintenance and calibration procedures for equipment and instrumentation are also provided along with sample collection methods. Analyte-specific tables provide information on the number of QA/QC samples to be prepared (duplicates, etc.) and the expected result as well as the person(s) responsible for assessing any problems and determining the proper course of action, if necessary.

1.7.3 Action Limits

Action limits for the air samples to be collected for this project are the PELs. The IAC 875, Chapter 10 adopts the OSHA standard for construction described in in 29 CFR 1926.1101(c)(1). The standard requires that employee exposure to airborne asbestos fibers be maintained below the PEL which is 0.1 (f/cc) of air as an eight-hour TWA. Additionally, the standard requires that no employee is exposed to airborne asbestos in excess of 1.0 f/cc as averaged over a sampling period of 30 minutes. The method for detecting the asbestos fibers is fiber counting by PCM.

See Table 1-1. Analytical Parameters and Target Limits

Table 1-1. Analytical Parameters and Target Limits
Matrix/Media: Air

Analytical Parameter	Project Action Limit/Level (applicable units)	Laboratory Limits (applicable units)	
		Quantitation Limits	Detection Limits
PCM – 8 hour TWA	0.1 f/cc	Not Applicable	10 fibers per 100 fields
PCM – 30 minute Excursion Limit	1.0 f/cc	Not Applicable	10 fibers per 100 fields

Action limits for the soil and groundwater that may be collected for this project are the Tier 1 Levels as indicated in IAC 455B, Chapter 135.9.

See Tables 1-2 and 1-3. Analytical Parameters and Target Limits

Table 1-2. Analytical Parameters and Target Limits Matrix/Media: Soil			
Analytical Parameter	Project Action Limit/Level (µg/kg)	Laboratory Limits (applicable units)	
		Quantitation Limits	Detection Limits
Benzene	540	1	0.27
Toluene	3,200	2	0.35
Ethylbenzene	15,000	2	0.34
Xylene	52,000	8	1.38
Waste Oil	No Limit	500	168
Diesel	3,800,000	500	168

Table 1-3. Analytical Parameters and Target Limits Matrix/Media: Groundwater			
Analytical Parameter	Project Action Limit/Level (µg/L)	Laboratory Limits (applicable units)	
		Quantitation Limits	Detection Limits
Benzene	5,000	0.5	0.05
Toluene	1,000,000	2	0.1
Ethylbenzene	700,000	2	0.1
Xylene	10,000,000	4	0.28
Waste Oil	400,000	1,000	400
Diesel	1,200,000	1,000	400

1.8 Special Training Requirements/Certification

Proper training of field personnel represents a critical aspect of meeting the data quality objectives in order to fulfill the goals of this QAPP. Blackstone staff that collect environmental data under this QAPP will be experienced in performing the project tasks required or will be supervised in the field by an experienced team member.

Asbestos abatement workers must be licensed as required by the Iowa Bureau of Labor. IDNR maintains a list of Iowa-registered asbestos workers. These registered workers are required to successfully complete an initial training course and annual refresher courses. This project requires licensed asbestos workers and will use Iowa-registered asbestos workers. A list of all personnel who will be involved in the abatement activity, their Iowa license, and documentation of respirator fit testing will be provided to the Project Manager and stored with the project documents.

Individuals conducting work under this QAPP are required to read the applicable SOP's and sign acknowledgement forms prior to conducting data collection, management, or analysis activities. Applicable Blackstone SOPs are provided in Appendix B.

Subcontractors, including laboratories, are prequalified through evidence of experience performing similar projects and through references. Laboratories used for analyzing soil and groundwater environmental samples must meet one of the following criteria:

- Participation in EPA Contract Laboratory Program (CLP).
- Performance of periodic performance evaluation blind sample analyses and receipt of an acceptable or greater rating.
- Participation in accredited analytical laboratory certification program (international, state, military, or other agency, such as the National Environmental Laboratory Accreditation Conference):

The laboratory must also have a written quality assurance program that complies with EPA Requirements for Quality Management Plans.

Laboratories used for analyzing asbestos air samples must be accredited by NVLAP.

1.9 Documents and Records

Documentation of data generated from tasks covered by this QAPP must be of sufficient quality to withstand challenges to their validity, accuracy, and legibility. To meet this objective, data are recorded in standardized formats and in accordance with prescribed procedures. The documentation of environmental data collection activities must meet the following minimum requirements:

- Data and associated information must be documented directly, promptly, and legibly by the observer onto established forms or in designated field logbooks. Reported data must be uniquely traceable to the raw data. Data reduction, correction or transformation changes must be documented, dated, and initialed.
- Original data records include, as appropriate, a description of the data collected, units of measurement, station or location identification, name or initials of the person collecting the data, date and time of collection, and the unique sample identification number.
- Changes to the original (raw data) entry must not obscure the original entry. The reason for the change must be documented, the change must be initialed and dated by the person making the change and approved by the Blackstone Project Manager.

Document control procedures ensure that relevant project documents are accurate, up-to-date, and available when information is needed for technical or administrative reasons. During project performance, hard copy working files may be maintained by personnel in their work or field offices. Once the project is completed, relevant hard copy documents will be filed in the office project file or scanned and maintained as an electronic document in the project file on the network servers.

1.10 Project Files

The Field Team Leader is responsible for maintaining the field project file, including copies of chains-of-custody, receipts, bills of lading, printouts of instrument downloads, daily logs, and checklists, as applicable. Once the field work is completed these documents will be placed in the final project files, along with copies of field logbooks, instrument downloads, and project photographs. Both hard copy and electronic project files are maintained in the Blackstone office. Electronic files are maintained by a secure cloud storage and online backup company.

Field and analytical data will typically be reduced for presentation in a project report. Laboratory data and most field instrument downloads are provided in electronic formats that are compatible with spreadsheet software such as Microsoft Excel, which will be used for presentation in the report. The direct conversion into such software minimizes the potential for transcription errors. The person conducting the project quality assurance review is also responsible for cross checking report tables with the raw data.

Complete project files will be maintained for the length of time specified by contractual or regulatory requirements. However, Blackstone policy is to retain files for 10 years, unless client or regulatory agency requirements mandate a longer retention policy. Records retained indefinitely include:

- contracts/subcontractor agreements.
- insurance certificates.
- final reports (original and/or electronic versions).
- final plans, specifications, cost estimates or other documents signed and sealed by a Blackstone professional engineer or professional geologist.

1.11 Field Documentation

Project field logbooks or sampling forms provide a useful technical record of activities and observations. The field documentation should be complete, accurate, and legible. Documentation will consist of consecutively numbered pages, and each page will be signed and dated by the individual recording the information it contains. Entries will be in waterproof ink and there will be no blank lines. Times of entries will be noted.

Examples of the type of information that should be recorded in field logbooks or on field sampling forms should include:

- Date.

- Environmental conditions.
- Field team members and visitors.
- Photographs (number and subject).
- Samples (identification number).
- Field changes (sample location, type, etc.).
- Field observations and measurements.
- Log of sampling locations.
- Equipment calibration and maintenance.
- Sample shipment.
- Deviations from the QAPP and/or complications encountered during field activities.

The specific information is dependent on the project scope. However, the information should be sufficient to reconstruct sampling activities.

1.12 Photographs

Photographs provide valuable documentation of site investigation activities. They should be used to record specific observations relating to the Site, sample locations, sample types, and general Site conditions and activities.

1.13 Document Control

Document control procedures ensure that relevant project documents are accurate, up-to-date, and available when information is needed for technical or administrative reasons. The documents discussed in this section should ultimately be retained in the project files in either electronic or hard copy form.

QAPP and health and safety plan documents are maintained electronically on the Blackstone office network servers as a word (or equivalent) and electronic pdf document in the individual project file. This ensures that the latest version of the document is available to personnel. Documents are identified by date and version number. Document updates will be transmitted to other users on the project team as changes are made to the document.

The final project report will include at a minimum, background information, discussion of objectives and scope, a description of the field investigation activities including deviations from the QAPP, presentation and evaluation of analytical results, quality assurance/quality control, a discussion of findings, and conclusions. Field documentation, access agreements, photographs, and original analytical data and chain-of-custody paperwork will be included in appendices, as applicable.

During project performance, hard copy working files may be maintained by personnel in their work or field offices. Once the project is completed, all relevant hard copy documents will be filed in the office project file or scanned and maintained as an electronic document in the project file on the network servers. The types of documents to be retained are indicated by the file categories including:

- background information.
- contracts and invoices.
- working files (e.g., correspondence, data, etc.).
- submittals.

Electronic files will be stored under the project files on the Blackstone office network server. These files are organized by client and project number.

Blackstone's Project Manager will be responsible for supervising the administrative support personnel in maintaining the project files for the duration of the project and shall not exceed five years without resubmission of a QAPP and approval. The project files will be kept in Blackstone's Kansas City office while the project remains active.

1.13.1 Laboratory Documentation and Records

The Blackstone Project Manager, in conjunction with the Cates Laboratory, Iowa Environmental Services, and Teklab, Inc. QA Managers, has the primary responsibility for defining site-specific data reporting requirements and relating them to the Field Activities Coordinator. These requirements, the turnaround time for receipt of deliverables specified, and site-specific requirements for retention of samples and laboratory records, should be clearly defined in requests for analytical services. The laboratory QA Managers are responsible for ensuring that all laboratory data reporting requirements in the QAPP are met. It is also the responsibility of the Blackstone Project Manager to provide the Field Activities Coordinator with the most recent version of the EPA-approved QAPP.

The data generated by the laboratory for each sampling event will be compiled into individual data packages/reports. The data packages will include the sample results and copies of the chain-of-custody forms.

The data packages will be reviewed by the Laboratory QA Officer to ensure the accurate documentation of any deviations from sample preparation, analysis, and/or QA/QC procedures; highlights of any excursions from the QC acceptance limits; and pertinent sample data. Once finalized, the Laboratory QA Officer will provide the data packages/reports to the Laboratory Project Manager who will sign them and submit them to the Project Manager. Problems identified by the Laboratory QA Officer will be documented in the narrative part of the report. Information about the documentation to be provided by analytical laboratory is also contained in the laboratory's QA Manual (Appendix A).

1.13.2 Labels

The samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. The samples will have preassigned, identifiable, and unique numbers. At a minimum, the sample labels will contain the following information:

- Sampling location
- Unique sample number

- Date and time of collection
- Initials/signature of sampler

Each sample location will have a unique sample identification number. A copy of an example label is included in Appendix A.

1.13.3 Sample Chain-of-Custody Forms

Chain-of-custody forms will be provided by the laboratory. The forms will be used to document collection and shipment of samples for off-site laboratory analysis. Sample shipments will be accompanied by a chain-of-custody form. The forms will be completed and sent with each shipment of samples to the laboratory. Copies will be sent to the Project Manager/QA Officer. The chain-of-custody form will identify the contents of each shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until the samples are shipped, the custody of the samples will be the responsibility of the field personnel, who will sign the chain-of-custody form in the "relinquished by" box and note the date and time. Procedures for completion and distribution of the chain-of-custody form is included in Appendix A.

2.0 DATA GENERATION AND ACQUISITION

This section specifies the methods to be used in collecting and analyzing environmental media for the project (i.e., air sampling for asbestos and soil and groundwater sampling). The purpose is to ensure that appropriate methods for sampling, measurement and analysis, data collection or generation, data handling, and quality control activities are employed and documented. Pertinent information will be recorded on field logs.

2.1 Sampling Design

Procedures for the sampling process design are part of an overall data quality objectives process completed during project planning. The factors to be considered in the design include possible sources, potential receptors, contaminants of concern, and state programs involved.

For EPA Brownfields Cleanup activities, a non-probabilistic sampling (judgmental) approach may be used to provide subjective information to assess for the presence of asbestos in the air during abatement activities. A brief definition of the basic sampling approaches is provided below.

Judgmental Sampling—Judgmental sampling is the subjective selection of sampling locations based on historical information, visual inspection, and the best professional judgment of the sampler.

While the stockpile of debris is on Site prior to removal, air sampling will be conducted weekly to verify the tarp covering the debris is containing the debris and suspected ACM. The approximate sample locations are presented as Figure 2.

During the demolition and removal of debris, samples will be collected approximately every 200 feet along the designated demolition work area fence. The approximate sample locations are presented as Figure 3. In addition, personal air samples will be collected representing a full shift including one sample for each job classification. One short term exposure sample will be collected which represents the 30-minute time period in which the highest fibers are expected.

If an UST is identified on Site, a sample of liquid or sludge (whichever is present) from the UST will be collected to assess the contents. A determination of whether or not the UST is a regulated tank will be based on the results. If the contents are waste oil, permitting of the UST will not be required by the IDNR. If other petroleum constituents are identified, the UST will need to be permitted through IDNR prior to removal. Once removed, soil sampling will be conducted beneath and around the UST. As the size of the UST is unknown at this time and the number and locations of the samples required by IDNR are dependent on the size of the UST, the sampling will be conducted in general accordance with IDNR UST Closure Guidance dated May 2021 (Appendix C). As required by IDNR, a temporary groundwater well will be installed within 20 feet of the presumed downgradient direction from the UST and a groundwater sample will be collected.

Table 2.1 Sampling Design and Rationale

Sampling Location	Matrix	Appropriate Units	Analytical Parameter	Rationale for Sampling Design
North and south of the debris pile	Air	f/cc	PCM	Assess if asbestos fibers have been released
Approximately every 200 feet along fence line	Air	f/cc	PCM	Assess if asbestos fibers have been released
Personal – eight hour TWA	Air	f/cc	PCM	Assess if personnel have been exposed to airborne asbestos
Personal – 30 minute excursion limit	Air	f/cc	PCM	Assess if personnel have been exposed to airborne asbestos
Inside UST	Liquid and/or sludge	ppm	Iowa Method OA-2	Assess contents of UST
Around and beneath the UST	Soil	ppm	Iowa Method OA-1 and OA-2	Assess if UST had leaked
Within 20 feet of the presumed downgradient direction of UST	Groundwater	ppm	Iowa Method OA-1 and OA-2	Assess if UST had leaked

Air samples for asbestos will be collected weekly prior to the debris being removed. During demolition and removal, sampling will be conducted daily.

Liquid and/or sludge sampling will be conducted of the UST contents if found. Soil and groundwater samples will be collected as required by IDNR once the removal is complete.

A summary of the samples to be collected is provided below.

Table 2.2 – Summary of Field and QC Samples to be Collected

Sampling	Matrix	Analytical Parameters	Number of Sampling Locations	Number of Field Duplicates	Number of Equipment Blanks	Number of MS/MSD Samples	Total Number of Samples
Debris Pile	Air	PCM	3	1 every approximate 10 samples	Not Applicable	Not Applicable	53
During Demolition and Debris Pile Removal	Air	PCM	8	1	Not Applicable	Not Applicable	90
Personal – eight-hour TWA	Air	PCM	2	0	Not Applicable	Not Applicable	20
Personal – 30-minute excursion limit	Air	PCM	1	0	Not Applicable	Not Applicable	10
UST Removal – Testing of contents	Liquid or Sludge	Iowa Method OA-2	1	0	0	0	1
UST Removal	Soil	Iowa Method OA-1 and OA-2	TBD	1	1	0	TBD
UST Removal	Groundwater	Iowa Method OA-1 and OA-2	1	1	1	0	3

2.2 Sampling Methods

2.2.1 Asbestos Air Sampling

Samples will be collected and handled in accordance with the SOPs for Collection of Airborne Asbestos Fibers provided in Appendix B which were developed from state and national guidance.

2.2.1 Liquid/Sludge, Soil, and Groundwater Sampling

Samples will be collected and handled in accordance with the following SOPs provided in Appendix B which were developed from state and national guidance:

- Standard Operating Procedure for Groundwater Sampling
- Standard Operating Procedure for Soil Sampling
- Standard Operating Procedure for Soil Screening with a PID
- Standard Operating Procedure for Chain of Custody
- Standard Operating Procedure for Equipment Decontamination
- Standard Operating Procedure for Investigative Derived Waste

Additional SOPs that address specialized sample collection and screening techniques may also be incorporated, if approved by the EPA Brownfields Project Manager.

2.3 Sample Handling and Custody

The samples will be handled in accordance with the Blackstone COC SOP (Appendix B), which was developed following state and federal guidance. Deviations from COC procedures will be noted in the report.

A sample label will be placed on the cassette indicating a unique sampling number. The cassette will be placed in a manila-type envelope or other appropriate container that will not relay a static charge to the cassette. The samples will then be transported to the laboratory with the chain-of-custody by hand or via mail carrier.

Examples of sample labels, chain-of-custody forms, and sample custody logs are included in Appendix A.

2.3.1 Field Health and Safety Procedures

A Site-specific Health and Safety Plan has been prepared and is included as Appendix D. A safety meeting will be held the first day of the samplings event to discuss emergency procedures (e.g., location of the nearest hospital) and local contact information (e.g., names and telephone numbers of local personnel, fire department, police department). PPE to be worn is included in the Health and Safety Plan in Appendix D. At a minimum, safety glasses, nitrile gloves, and steel-toed boots will be worn.

2.4 Analytical Methods

Samples will be analyzed by Cates Laboratories, Iowa Environmental, Inc., and Teklab, Inc. They have provided QA Manuals which are provided in Appendix A.

The preparation and analysis of fixed-base laboratory samples is described in general in the manuals. Specific method protocols will be within recommended procedures of standard methods. The samples will be analyzed within standard turnaround time unless the Blackstone Project Manager deems “rush” analyses are necessary to meet project goals.

The following tables present the analytical method, container type, preservation, and holding time requirements for the samples to be collected.

Table 2.3 – Analytical Method, Container, Preservation, and Holding Time Requirements				
Matrix: Air				
Analytical Parameter	Analytical Method Number	Containers	Preservation	Maximum Holding Time
PCM	NIOSH 7400	MCEF filters	None	None

Table 2.4 – Analytical Method, Container, Preservation, and Holding Time Requirements				
Matrix: Liquid/Sludge				
Analytical Parameter	Analytical Method Number	Containers	Preservation	Maximum Holding Time
TEH	Iowa Method OA-2	4-oz glass jar	4° Celsius	~~14~~ 7 ~~business~~ days

Table 2.5 – Analytical Method, Container, Preservation, and Holding Time Requirements				
Matrix: Soil				
Analytical Parameter	Analytical Method Number	Containers	Preservation	Maximum Holding Time
TEH	Iowa Method OA-2	4-oz glass jar	4° Celsius	14 ~~business~~ days
BTEX	Iowa Method OA-1	4-oz glass jar	4° Celsius	14 ~~business~~ days

Table 2.6 – Analytical Method, Container, Preservation, and Holding Time Requirements				
Matrix: Groundwater				
Analytical Parameter	Analytical Method Number	Containers	Preservation	Maximum Holding Time
TEH	Iowa Method OA-2	250 mL amber jar	4° Celsius	~~14~~ 7 ~~business~~ days
BTEX	Iowa Method OA-1	250 mL amber jar	4° Celsius	7 days without HCL preservation/14 days with HCL preservation~~14 business days~~

2.5 Quality Control Requirements

QC samples will be required to verify the validity of analytical results and, where QC issues arise, to assess whether samples were contaminated as a result of improper decontamination procedures, use of contaminated containers or preservatives, and/or introduction of contaminants during transportation of the samples to the laboratory. Field QC samples may include trip blanks, rinsate samples, and duplicates

as appropriate. Duplicate samples may be collected to assess the reproducibility of the sampling procedures and analytical methods. Temperature blanks are included to verify sample preservation.

For the asbestos air samples, blanks will be prepared by the field sampler and will be taken into the field by the sampling team. Closed field blanks are filter cassettes that have been transported to the Site and then sent to the laboratory without being opened. The Blackstone Project Manager, in conjunction with the QA Reviewer, will evaluate the results of the blanks to determine if they are acceptable. If sample results indicate contamination of blank samples (detections above method reporting limits), sampling and analysis may be performed again for the associated target analytes. The Project Manager, in conjunction with the QA Reviewer, will make this decision.

For the soil and groundwater samples to be collected, trip blanks will be prepared by Teklab, Inc. and will be taken into the field by the sampling team to determine whether any field-related activities resulted in the introduction of VOCs that would jeopardize the validity of analytical results. Field blanks are samples prepared in the field to assess whether contaminants were introduced by sample containers and/or preservatives. Rinsate samples are used to determine if decontamination procedures are being performed adequately to prevent cross-contamination between samples. The Blackstone Project Manager, in conjunction with the QA Reviewer, will evaluate the results of the trip, rinsate, and field blanks to determine if they are acceptable. If sample results indicate contamination of blank samples (detections above method reporting limits), sampling and analysis may be performed again for the associated target analytes. The Project Manager, in conjunction with the QA Reviewer, will make this decision.

Laboratory QC samples include duplicates, spikes, laboratory blanks, and PE samples as appropriate. Pertinent SOPs and guidance documents referenced in this QAPP will be followed to ensure QA objectives are met. Fixed-base laboratory QC procedures will be performed in accordance with the SOPs for the applicable analytical methods (Appendix B).

The following QA/QC guidance documents will be implemented as appropriate to ensure QA/QC elements are adequately addressed:

- *Guidance for the Data Quality Objectives Process* - EPA QA/G-4, OSWER. USEPA, February 2006.
- *EPA Requirements for Quality Assurance Project Plans* - EPA QA/R-5, March 2001.
- *Guidance for Quality Assurance Project Plans* - EPA QA/G-5, OSWER, USEPA, December 2002

QC samples will be required to verify the validity of analytical results and, where QC issues arise, to assess whether samples were contaminated as a result of the use of contaminated containers and/or introduction of contaminants during transportation of the samples to the laboratory. Field QC samples may include blanks and duplicates as appropriate. Duplicate samples may be collected to assess the reproducibility of the sampling procedures and analytical methods.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance

Field equipment will be calibrated, tested, and inspected in accordance with the manufacturers' specifications. Calibration and maintenance documents, battery chargers, and spare parts will be stored in the case alongside the associated field equipment or in a field logbook as appropriate. Field equipment manuals are presented in Appendix E.

Laboratory equipment will also be calibrated and maintained in accordance with the manufacturers' specifications and applicable laboratory analytical SOPs (Appendix B).

Laboratory instruments are maintained in accordance with manufacturer's specifications and the requirements of the specific method employed. This maintenance is carried out on a regularly-scheduled basis and is documented in the laboratory instrument service logbook for each instrument.

Laboratory analytical equipment, inspection, testing, and maintenance procedures are detailed in the Teklab Quality Assurance Manual (Teklab, 2022).

2.7 Instrument/Equipment Calibration and Frequency

Field equipment will be calibrated, tested, and inspected in accordance with the manufacturers' specifications. Calibration and maintenance documents will be stored in the case alongside the associated field equipment or in a field logbook as appropriate.

Laboratory equipment will also be calibrated and maintained in accordance with the manufacturers' specifications and applicable analytical SOPs and applicable laboratory SOPs.

Maintenance logs, including calibration frequency, are kept at each participating laboratory. Laboratory analytical equipment, inspection, testing, and maintenance procedures are detailed in the Teklab Quality Assurance Manual (Teklab, 2022).

2.8 Inspection/Acceptance Requirements for Supplies and Consumables

Blackstone maintains centralized control of field sampling expendables, supplies, and materials for conducting environmental sampling through the position of Environmental Activities Field Coordinator. Supplies and consumables that are of adequate quality to sustain confidence in the sample collection, processing, and laboratory analysis will be used. Purchased supplies and consumables will not be used until they have been inspected, calibrated, or otherwise verified to be in compliance with standard specifications relevant to calibrations or tests being performed and will be dedicated to that project. When possible, certified contaminant free sampling supplies and consumables (e.g., nitrile gloves) will be used and dedicated for one use at one location.

Analytical Laboratories provide pre-cleaned sampling containers for use by field sampling personnel. Cleaning is verified by the companies' QA Managers. These containers are obtained from reputable container manufacturers and are cleaned to EPA specifications (Specifications and Guidance for Contaminant-Free Sample Containers OSWER Directive #9240.0- 05A Dec 92). In addition, the

Blackstone Environmental Activities Field Coordinator will visually inspect containers for evidence of contamination, necessary preservatives, appropriate size, number, and material for the required analyses.

2.9 Data Acquisition Requirements

No data from other sources, except EPA Brownfields investigations and Phase I ESAs will be used for decision-making purposes. Any secondary (non-EPA Brownfields) information, including other analytical data, reports, photographs, maps, etc. from additional sources referenced in reports compiled by Blackstone, may not have been verified by Blackstone. This information is mentioned for informational purposes only and will be addressed as supplemental information. It is not to be used for decision-making purposes without verification by an independent professional who is qualified to verify such data or information.

2.10 Data Management

Blackstone's Project Manager will be responsible for supervising the administrative support personnel in maintaining the project files for the duration of the project and shall not exceed five years without resubmission of a QAPP and approval thereof by EPA. The project files will be kept in Blackstone's Moline office while the project remains active. Upon completion of the project, Blackstone will archive the project files until the completion of the project. After completion of the project, project files will be transferred to the City.

Blackstone will use portable laptop computers along with data loggers to record, process, and manage project data. The following software potentially will be used to process data: Access®, ArcGIS®, Aqtesolv®, AutoCad®, AutoDesk®, DQO/DEFT®, Excel®, Surfer®, VSP®, Word®,.

Laboratory data management will focus on a level requisite of EPA protocols and the standard methods. These procedures are set forth in Appendix A.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessments/Oversight and Response Actions

Both internal performance and system audits may be conducted during field operations. Performance audits include verification that field sampling activities and laboratory analyses of performance evaluation samples are being conducted in accordance with the requirements of this QAPP and any QAPP Amendment. System audits involve a qualitative examination of an environmental data collection system including records, personnel, and QA management activities.

This section describes the selection of audit personnel, the scope of field and laboratory audits, audit frequencies, and typical audit reports for internal audits initiated by the Blackstone QA Reviewer.

The fixed-base laboratory performance and system audits will be as outlined in Teklab, Inc.'s Statement of Quality Assurance (Appendix A).

3.1.1 Audit Personnel

The QA/QC Reviewer has the lead role in directing and executing all internal audit activities during an investigation. The QA/QC Reviewer is responsible for preparing an audit plan; coordinating and scheduling the audit with the project team or subcontractor; participating in the audit; coordinating the preparation and issuance of audit reports and corrective action request forms; and evaluating audit responses and resulting corrective actions.

3.1.2 Audit Scope of Work

Performance audits of field activities will be conducted to evaluate compliance with the requirements of this QAPP and any QAPP Amendments. Field system audits may include an examination of the following items:

- Sample collection records.
- Sample collection, handling, packaging, shipping, and custody records.
- Equipment operation, maintenance, and calibration records.

The laboratory performance and system audits by Teklab, Inc. will be completed as outlined in their Quality Assurance Manual (Appendix A).

3.1.3 Audit Frequencies

As necessary, this QAPP will provide a schedule for all planned audits to be conducted during the investigation. These audits may be required by EPA or planned by QA/QC Reviewer. Audit frequency will depend on several factors. In selecting investigations for auditing, the QA/QC Reviewer will consider investigations with a large volume of work or those on which EPA has placed a high level of importance. The QA/QC Reviewer may also randomly select investigations for auditing.

Unscheduled follow-up audits may occur if any deficiencies are discovered during an audit or review. Follow-up audits serve to verify that necessary corrective actions have been properly implemented to address deficiencies.

3.1.4 Audit Reports

Audit reports will be prepared for performance and system audits of field and laboratory activities and laboratory evaluation studies conducted under this Cooperative Agreement. Reports will be prepared by the QA/QC Reviewer. Audit reports will identify participants, describe the activity audited, summarize audit findings, and detail any deficiencies or deviations from protocol discovered during the audits, as well any corrective actions proposed. Field or laboratory analytical data generated during performance evaluation must be validated. Validated dates will be included in the audit reports.

Audit reports are distributed to the Blackstone Project Manager or laboratory QA manager, as appropriate. The QA/QC Reviewer has primary responsibility for ensuring audits are conducted

thoroughly and properly. The Blackstone Project Manager or laboratory QA Manager is responsible for implementing corrective actions resulting from the audit. The QA/QC Reviewer is responsible for verifying recommended corrective actions have been implemented.

3.1.5 Corrective Action

Corrective actions will be taken whenever problems appear to be adversely affecting data quality and/or when the resulting decisions may affect future response actions pertaining to the Site. When such conditions are identified, the following corrective actions will be taken:

- Document that suspect data have been obtained.
- Review the system in question to ensure procedures were properly performed.
  - If procedures were not carried out properly, then document errors and repeat the procedures in accordance with proper methodologies, including all applicable quality control checks.
  - If any control checks gave out-of-control results, advise the project supervisor, and do not continue until the problem has been resolved.
  - If all of the control checks gave satisfactory results after corrective actions have been taken, document the corrective actions and continue.

3.2 Reports to Management

Reports describing the project activities, status, results of audits, corrective actions, needs for resolution among participating parties, and schedule changes will be distributed electronically. Quality Assurance problems will be noted in the reports as needed. These are summarized below in the following table.

Table 4 - Routine Reports

Document	Party	Preparer	Frequency
Grant Reports	City	Project Manager	Quarterly throughout Grant and as determined by the City.
Daily Job Reports	Blackstone	Environmental Activities Field Coordinator	Daily when field work in progress with logbook copies.
Project Status Meetings	Blackstone	Project Manager	Weekly during field activities, otherwise monthly.
Website for Community Outreach	City	Communications Specialist	Updated at final report for project activities or as desired by the City.
Project Closeout Report	Blackstone / City	Project Manager	End of Project

4.0 DATA REVIEW AND USABILITY

This section addresses the quality assurance activities that occur after data collection or generation is completed. Subsections address how data will be reviewed, verified and validated as well as how data will be assessed and reconciled with the project objectives.

4.1 Data Review, Verification, and Validation Requirements

It will be the primary responsibility of the Blackstone Project Manager to review and, as far as possible, validate and verify all data collected by project activities meet QAPP objectives.

Blackstone will follow EPA's DQA process to verify that the type, quality, and quantity of data collected are appropriate for their intended use. The DQA process involves first verifying that the assumptions under which the data collection design and DQOs were developed have been met or taking appropriate corrective action if the assumptions have not been met. The DQA process then evaluates how well the data collected support the decision that must be made so scientifically valid and meaningful conclusions can be drawn from the data. To the extent possible, Blackstone will follow DQA methods and procedures outlined in EPA's Guidance for Data Quality Assessment: A Reviewer's Guide (EPA QA/G-9R) (February 2006) and Data Quality Assessment: Statistical Methods for Practitioners (EPA QA/G-9S) (February 2006).

4.2 Verification and Validation Methods

The Blackstone Project Manager will be responsible for validation of project implementation, conducting a direct comparison of the project records to the QAPP for the cleanup prior to writing the final report. This will be initiated immediately upon completion of the field activities on the Site. The final report will contain a section designated for data validation and verification. The data users will be provided with copies of the report.

Due to the limited nature of the validation, the QA Reviewer will conduct a minimum of one review per year, or as needed, of the Blackstone Project Manager's validation of project implementation. The QA Reviewer will evaluate the implementation of the following relative to field and management procedures as they apply to the Brownfields Cleanup. Data will be reviewed to evaluate conformance with the quality criteria set forth in the QAPP. These evaluations will include, but are not limited to:

- Conformance to the QAPP's data quality objectives.
- Conformance with sample handling protocols.
- Results of quality control checks as they relate to field influences on data quality.
- Results of calibration of instruments and field forms.

The Blackstone Project Manager will rely on standard methods conformance according to the laboratory SOPs and their system of flagging data in the laboratory data packages to support valid analytical data.

The review will specifically evaluate field and management procedures as they apply to the Site. The quality of the resultant data will be evaluated in accordance with of the following:

- Generic conformance to design parameters of the QAPP.
- Sampling design.
- Sample collection procedures as prescribed in protocols of Appendix B and compared to field documentation.
    - Sampling will be considered complete only if an adequate degree of completeness is represented by the data set allowing Site decisions to be made, as determined by the Blackstone Project Manager.
    - Sampling will be considered accurate if ninety-five percent (95%) of the sampling protocols stipulated were used and documentation supports proper use.
- Sample handling protocols and chain-of-custody will be reviewed.
- Quality control checks conducted as they relate to field influences on data quality.
- Calibration of instruments at mobilization and in the field from instrument records and field logbooks specific to the Site.

4.1.1 Laboratory Data Validation Methods

Data validation practices will be followed to ensure that raw data are not altered and that an audit trail is developed for those data which required reduction. Field data, such as those generated during field measurements, observations, and field instrument calibrations, will be entered directly into a bound field notebook, or onto project-specific data forms.

Analytical data generated during the project will undergo a rigorous laboratory data review. This review will be performed in accordance with the method requirements. A preliminary review will be performed to verify all necessary paperwork (chain-of-custodies, analytical reports, laboratory personnel signatures) and deliverables as stated in the requirements are present.

Upon receipt of the sample data packages, the laboratory data will be quantitatively and qualitatively validated by the laboratory's Quality Assurance Chemist to verify the qualitative and quantitative reliability of the data as it is presented. This review will include a detailed review and interpretation of data generated by the laboratory. The primary tools which will be used by experienced data review chemists will be guidance documents, established (contractual) criteria, and professional judgment.

It is anticipated that the laboratory's data reduction for this site assessment will be minimal and will consist primarily of tabulating laboratory analytical results onto summary tables through the use of computerized spreadsheet software. Analytical data will be provided in the form of electronic deliverables.

Based upon the review of the analytical data, a quality assurance report will be prepared by the laboratory which will state in a technical, yet "user friendly" fashion, the qualitative and quantitative reliability of the

analytical data. The report will consist of a general introduction section, followed by qualifying statements that should be taken into consideration for the analytical results to best be utilized. Based upon the quality assurance review, qualifier codes will be placed next to specific sample results on the sample data tables. These qualifier codes will serve as an indication of the qualitative and quantitative reliability of the data. Laboratory procedures to address QA/QC issues are outlined in the Teklab Quality Assurance Manual.

4.1.2 Blackstone Data Validation methods

Using the documentation provided by the laboratory, detection limits, holding times, COC, surrogate recoveries, method blanks, LCS, MS/MSD, trip blanks, and field duplicates will be reviewed for conformance with project guidelines, outlined below: If quality control/quality assurance (QA/QC) issues are identified during the data validation process, the Blackstone Quality Assurance Manager or Project Manager will contact the laboratory to resolve the issues. Information generated regarding the resolution of the QA/QC issues will be included in the final report.

Raw field data will be summarized, reduced, or tabulated for use in the site assessment reports by the Project Geologist or Technician, and reviewed by the Quality Assurance Manager. Laboratory analytical data will be summarized and tabulated upon receipt, validated and qualified, and the final data submitted to the project team for use in the investigation reports.

4.1.2.1 Completeness Check

A completeness check will be performed upon receipt of the data and shall include a review of:

- case narrative.
- COC documentation.
- sample condition upon receipt.

The completeness check shall ensure that:

- all compounds and environmental samples are present.
- QC is present for every environmental sample.
- the most technically valid result is reported for each compound. This may result in full validation for a sample.

4.1.2.2 Data Verification Criteria

Data verification shall include, but is not limited to, reviewing the:

- completeness, as defined above.
- case narrative, including but not limited to, a description of non-conformances and corrective actions that were taken, plus anomalies, deficiencies, and QC problems that have been identified.
- COC documentation and original COC forms with identification numbers and laboratory receipt signatures, dates, and times.
- sample condition upon receipt, including cooler temperature, and shipping documentation.

- timeliness and a check for errors, including requested deliverables, preservation and holding times.
- sample analysis results, with quantitation limits and checking reporting limits checked against the contract required limits, and verifying dry weights, and dilutions.
- QC summary including but not limited to, method blanks, continuing calibration blanks, and preparation blanks, surrogate percent recoveries, spike percent recoveries and relative percent differences, and laboratory QC check sample and LCS recoveries.
- field duplicates, if identified, for which reproducibility shall be evaluated.
- laboratory RLs.
- laboratory duplicates.

4.3 Reconciliation with User Requirements

Following completion of each year's effort, the precision, accuracy, and completeness measures will be assessed and compared with the criteria. If data collected meet the DQOs for the study, then the data are considered to meet the objectives of the study. Uncertainties and limitations in the use of these data and interpretation of results will be provided to MDNR and will be reconciled, as possible.

5.0 REFERENCES

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- *EPA Requirements for Quality Assurance Project Plans* - EPA QA/R-5, March 2001.
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- Title 40, Code of Federal Regulations, Part 61, Subparts A and M, National Emission Standards for Hazardous Air Pollutants. U.S. EPA.
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- National Institute for Occupational Safety and Health. 1977. Occupational Exposure Sampling Strategy Manual, Publication No. 77-173, January 1977.
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- U.S. Environmental Protection Agency (USEPA). Requirements for Quality Management Plans (QA/R-2), EPA/240/B-2/002, March 2001, reissued May 2006.
- U.S. Environmental Protection Agency (USEPA). Guidance for Preparing of Standard Operating Procedures, EPA QA/G-6, EPA/600/B-07/001, April 2007.
- Blackstone Environmental. SOPs, 2023.

6.0 LIMITATIONS

This report was prepared in accordance with that level of skill and care ordinarily exercised by other members of Blackstone's profession practicing in the same locality and under similar conditions when the services were provided. No warranties, express or implied, are intended or made.

7.0 FIGURES

8.0 APPENDICES

APPENDIX A. LABORATORY DOCUMENTATION

APPENDIX B. SOPS

APPENDIX C. TANK CLOSURE GUIDANCE

APPENDIX D. HEALTH AND SAFETY PLAN

APPENDIX E. FIELD DOCUMENTATION AND EQUIPMENT

8.1 APPENDIX A - LABORATORY DOCUMENTATION

8.2 APPENDIX B - SOPS

8.3 APPENDIX C - TANK CLOSURE GUIDANCE

8.4 APPENDIX D – HEALTH AND SAFETY PLAN

8.5 APPENDIX D – FIELD DOCUMENTATION AND EQUIPMENT