APPENDIX E
QUALITY ASSURANCE PROJECT PLAN

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QUALITY ASSURANCE PROJECT PLAN

202-218 MORGAN AVENUE

BROOKLYN, NEW YORK

PROJECT #47743

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APPENDICES

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the organizational structure, data quality objectives (DQOs), and data management scheme for conducting surface and subsurface soil sampling associated at the 202-218 Morgan Avenue site located in Brooklyn, New York. The 202-218 Morgan Avenue site has been entered into the New York Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) and has been assigned Site No. C224133. This document defines the specific quality control (QC) checks and quality assurance (QA) auditing processes to be undertaken at the 202-218 Morgan Avenue site. The QAPP is designed to assure that the precision, accuracy, representativeness, comparability, and completeness of the collected data are known, documented, and adequate to satisfy the DQOs of the study. The format and contents of this QAPP have been prepared in accordance with the United States Environmental Protection Agency (EPA) guidance documents: "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans" (EPA 2001).

This QAPP serves as an overall summary of the quality assurance/quality control (QA/QC) structure of the environmental and/or endpoint soil samples and samples for disposal purposes. Some parts of the structure are described in this document (e.g., data management); and, other parts will referenced to the QAPP (e.g., Standard Operating Protocols and Procedures [SOPs]), which will provide detailed descriptions of the methodologies that will be followed during the sampling activities.

The internal laboratory SOPs and QA/QC procedures are described in the Laboratory's QAPP, an independent plan provided by the analytical laboratory. The Laboratory QAPP will be kept on file with this QAPP.

2.0 PROJECT DESCRIPTION

The objective of this project is to collect environmental and endpoint samples to verify whether the soil excavation activities or proposed activities have the potential to remove soil concentrations above the Restricted Use – Industrial SCOs for arsenic, lead, mercury, and PCBs and to collect samples for disposal purposes, if applicable. Specific details of the sampling techniques are further discussed in the NYSDEC-approved Remedial Work Plan (RWP).

2.1 Data Quality Objectives

The data obtained from the samples collected at the site will be used to provide information to satisfy the data quality objective (DQO) for the collection of environmental and/or endpoint samples to verify the removal of arsenic, lead, mercury, and PCBs impacted soil with concentrations exceeding the Restricted Use - Industrial SCOs and for the collection of samples to verify whether the soil designated for disposal is hazardous or non-hazardous.

DQOs are established goals for precision, accuracy, completeness, representativeness, comparability, and reporting limits for the sampling and analytical methods used. They serve as the basis for specifying the QA/QC procedures and protocols that will be employed during the data collection process to enable the data to be used for the intended purpose.

DQOs are based on the concept that different data uses may require different levels of data quality. DQOs are defined with respect to the types, number, and locations of samples that will be collected, and the QA levels associated with the analysis. Soil samples will be analyzed for arsenic and lead in accordance with EPA Methods 6010/7000, for mercury using EPA Method 7471, for PCBs using EPA Method 8082, and for Toxicity Characteristic Leaching Potential (TCLP) using EPA Method 1311. All other analytes will be analyzed in accordance with the applicable USEPA method.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The responsibilities of the key project personnel are detailed below.

- The Project Director is responsible for overseeing the implementation of the remedial activities. To the maximum extent possible, all documents, including reports, approvals and other correspondence concerning the activities performed will be directed through the project director.

- The Project Manager is responsible for sampling QC; overall project coordination; adherence to the project schedules; directing, reviewing, and assessing the adequacy of the performance of the technical staff and subcontractors assigned to the project; implementing corrective action, if warranted; interacting with the project director; preparing reports; and, maintaining full and orderly project documentation.

- The Field Team members include the sampling team, support staff and experts in hydrogeology and engineering who are responsible for the technical direction and adequacy of the work in their respective areas of specialty which are or may be required to meet the project objectives.

- The Project QA/QC Officer is responsible for performing systems auditing, and for providing independent data quality review of project documents and reports.

- The Site Health and Safety Supervisor (SHSS) is responsible for implementing the site-specific health and safety directives described in the Health and Safety Plan (HASP) and for contingency response.

- The Field Leader is responsible for coordination of the activities of field personnel and subcontractors; adherence of the field work to the procedures specified in the QAPP, HASP, and the Remedial Action Work Plan; and, rigorous documentation of the field work. The field leader is also designated as the SHSS.

4.0 QUALITY ASSURANCE OBJECTIVES FOR DATA MEASUREMENT

The data obtained from the samples collected at the 202-218 Morgan Avenue site will be used to provide information to satisfy the DQO of delineating the impacted surface and subsurface soil, as well as for soil disposal purposes.

DQOs are based on the concept that different data uses may require different levels of data quality. DQOs are defined with respect to the types, number, and locations of samples that will be collected, and the QA levels associated with the analysis. Soil samples will be analyzed for arsenic, lead, mercury, PCBs, and constituents associated with TCLP analysis. Groundwater samples will be analyzed for volatile organic compounds (VOCs), arsenic, and lead, as appropriate.

The overall QA objective is to develop and implement procedures for field measurements, sampling, and analytical testing that will provide data of known quality that is consistent with the intended use of the information. This section defines the objectives by (1) describing the use of the data (2) specifying the applicable QC effort (field checks and analytical support levels), and (3) defining the QC objectives (data quality acceptance criteria).

4.1 Data Usage and Requirements

The intended uses of the data from the sample collection are to verify that the soil excavation activities remove soil concentrations exceeding the Restricted Use - Industrial SCOs and to verify whether the soil designated for off-site disposal is characterized as hazardous or non-hazardous. The data will be quantitative laboratory analyses.

The soil samples will be collected with clean spatulas or other appropriate sampling equipment. All soil samples will be collected as grab samples as identified in the Remedial Action Work Plan at specified depths. Additional soil samples may be collected if field observations (staining, odors, etc.) indicate the need to do so. These samples will be sent to the laboratory for arsenic, lead, mercury, PCB, and TCLP analysis.

Quantitation limits for the laboratory analyses will be in conformance with the appropriate EPA methodology for the specified analyses unless dilution or interference effects make it necessary to raise them. The laboratory will achieve quantitation limits as low as practicable and will report estimated concentration values at less than the detection limit by flagging the value with a "J".

4.2 Level of Quality Control Effort

The sampling team will collect QA/QC samples including field blank samples to ensure and document the integrity of the sampling procedures, laboratory sample handling procedures, and the validity of the measurement data.

Analyte-free deionized water will be obtained from the laboratory to be used for collecting field blanks and the final decontamination rinse where required. This water will be prepared and analyzed by the laboratory on a routine basis and a record of this data will be kept on file. Protocols for the handling of field blanks and decontamination of equipment are provided in the Remedial Action Work Plan. Field blanks will be prepared and analyzed for the same parameters as the samples to determine if cross-contamination has occurred during sampling.

Field blank samples will be collected at a frequency of one per 20 samples collected. Duplicates and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a rate of 1 per 20 or each sample delivery group. The data package provided by the laboratory will meet the specifications of a full Analytical Services Protocols (ASP) Category B deliverable package. A NYSDEC Data Usability Summary Report (DUSR) will be prepared for submission to NYSDEC. The level of QC effort when analyzing the samples collected at the site will conform to standard NYSDEC protocols (NYSDEC 2000).

4.3 Quality Control Objectives

The QC objective for the soil sampling activities is to provide data of known and acceptable quality. Several different types of QC check samples will be analyzed and the results will be compared to data quality acceptance criteria and/or QC control limits that are specified for each method. The laboratory will routinely run these QC samples in accordance with the protocols and frequencies specified in the analytical methods. The QC check samples may include the following:

- Blank samples
- Initial and continuing calibrations
- Surrogate spikes
- Matrix spikes/analytical spikes
- Duplicate samples
- Control samples

The specific types and frequencies of QC checks which will be performed in support of each test method, the calibration procedures for each instrument, and the QC control limits and/or data quality acceptance criteria for each of the types of QC check samples, are specified in the laboratory's QAPP and shall be in accordance with Environmental Laboratory Accreditation Program (ELAP) protocol.

5.0 SAMPLING PROCEDURES

Samples will be collected in accordance with the NYSDEC-approved Remedial Work Plan (RWP). The following sections describe the protocols for sample collection:

Sample Container Acquisition: All sample containers will be obtained from the laboratory. The sample containers will be pre-cleaned in accordance with the laboratory's standard operating procedures.

Sampling Methodology: Decontaminated spatulas or other applicable sampling equipment will be used to advance the sampling equipment and to obtain soil samples. Dedicated or disposable sampling equipment will be used where possible. Plastic sampling equipment will not be used for collection of samples that will be analyzed for organic compounds. The grab sample will be placed directly into the appropriate laboratory-supplied sample jar by the field scientist using the dedicated, disposable sampling or stainless steel spatula or knife (for soil samples). The samples will then be placed into an ice-filled insulated cooler and stored at 4° Celsius until delivery to the laboratory. The samples will be picked-up daily by courier to the laboratory for the analysis. Field observations and measurements during sample collection will be recorded in a bound field notebook with each page dated and numbered.

Decontamination of Sampling Equipment: All non-dedicated sampling equipment will be decontaminated prior to and following sample collection using a phosphate-free detergent wash and then rinsed with water.

Sample Packaging and Shipment: Samples collected during this project can be non-hazardous, as well as hazardous. If unusual odors, coloration, other conditions or pre-existing data are identified that suggest the environmental media might be characteristic hazardous, special handling and shipping protocols would be necessary. Samples will be picked-up daily and delivered directly to the laboratory at the completion of each day of sampling. Custody of the samples must be maintained through the shipment of samples to the laboratory. All samples will

be packaged in a manner which avoids breakage or contamination. Samples will be in the custody of the sampling crew until relinquished directly to the laboratory in person or shipped via overnight courier using the following procedures:

- Place about three inches of inert cushioning material (i.e. bubble wrap) in the bottom of the cooler.
- Place and seal the sample containers in clear, reusable plastic bags and pack the containers in the cooler.
- Place suitable cushioning material around the sample containers.
- Place ice cubes into reusable plastic bags and pack the ice in the cooler; use sufficient ice to maintain 4°C until the samples arrive at the laboratory.
- Sign and retain a copy of the Chain-of-Custody form; place the form into a reusable plastic bag and pack in the cooler.
- Apply signed custody seals to the front and back of the cooler so the seals bridge the cooler and lid.
- Secure the lid by completely wrapping it with clear plastic packaging tape.
- Attach the completed shipping label to the top of the cooler; retain the shipment tracking number on the copy of the Chain-of Custody form, and ship the cooler via overnight to the laboratory.

5.1 Sample Labeling

Sample labels are required to include the following information:

- Client name
- Site name
- Sample number
- Sample matrix
- Parameters to be analyzed

- Date of collection
- Time of collection
- Type of preservative
- Sampler's name

In addition, sample-specific information for the laboratory (e.g., odor, color) may also be written on the label.

5.2 Sample Numbering

A unique sample number will be used to identify a location (e.g. source area), sample matrix, a sequential number for each sample type, a sample depth, and the date and time the sample was collected. The typical format for designating the sample number will be X/XX/XX-XX/MMDDYY, where:

X = Sample Location

XX = a two-digit sequential number for each sample

XX-XX = sample depth interval (in feet) from which the sample was collected

MMDDYY = month, day, and year of the sample collection

The soil sample identification number will be based upon the boring identification number and sample depth interval (e.g., a sample ranging from 0 to 6 inches in sample SB-1-1 would be identified as SB-1-1_0-6). SB-1 is an abbreviation for a specific source area which is identified and discussed in the RWP.

QA/QC samples will be collected at a rate of one per 20 total samples collected. QA/QC samples will be labeled as indicated below:

Field Blanks = FB-XX/MMDDYY

Field/equipment blanks will be identified as FB and the sampling date (i.e., a field blank sample prepared for August 30, 2012 would be identified as FB-01/083012).

If conditions require re-sampling of a sample location (i.e. the sample is not retrieved properly), the sample will be labeled as described above with a "RS" placed at the end of the sample number.

5.3 Sample Custody

A chain-of-custody record will be maintained for each sample collected and will provide an accurate written record that can be used to trace the possession of samples from collection through analysis and reporting. Sample bottles to be used for this project will be selected, prepared, and quality controlled according to Office of Solid Waste and Emergency Response (OSWER) Publication 9240.05A, EPA/540/R-93/051, December 1992 "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers".

The procedures that will be followed to provide the chain-of-custody in the field from sample collection through shipment to the laboratory (including sample preservation) are specified in the Remedial Action Work Plan. The procedures that will be used to continue the chain-of-custody for each sample from its arrival in the laboratory through analysis and reporting will be specified in the laboratory QAPP. The laboratory sample custody procedures will conform to EPA guidelines. The project samples will be retained by the laboratory for 30 days after completion of analyses.

5.4 Chain-of-Custody Record

The Chain-of-Custody provides an accurate written record that can be used to trace the possession and handling of the sample from the time of collection to analysis. The Chain-of-Custody form will be completed for each sample at the time of collection and will be maintained while shipping the sample to the laboratory. The following information must be entered on the Chain-of-Custody form:

- Project number

- Project name
- Signature of sampler
- Sample number
- Date and time
- Sample matrix
- Parameters for analysis
- Remarks, as needed

All samples will be delivered to the laboratory within 24 hours from time of collection. Laboratory results will be received within 24 hours from the time of delivery to the laboratory.

5.5 Field Quality Assurance

Quality assurance will be an ongoing process during field activities. The Site Health and Safety Supervisor (SHSS) is responsible for ensuring that field activities follow the requirements specified in this QAPP, and that good field sampling practices are followed.

In addition, at the completion of each sampling activity, all field records pertinent to the sampling event will be reviewed by the Project Manager, or a designee, to check for compliance with the procedures outlined in this QAPP. All findings will become part of the permanent project file, and made available to NYSDEC upon request.

Field quality assurance may include verification of the following:

- Completeness and accuracy of sample chain-of-custody forms, including documentation of times, dates, sample identification and signatures;
- Completeness and accuracy of sample identification labels, including notation of time, date, location, type of sample, person collecting sample, preservation method used, and type of testing required;
- Completeness and accuracy of field logbooks, including documentation of times, dates,

sampling methods, sampling locations, number of samples taken (including QA/QC samples), name(s) of person(s) collecting samples, types of samples (including QA/QC samples), results of field measurements, and any problems encountered during sampling;

- Adherence to sample collection, preparation, preservation, and packaging procedures.

5.6.1 Field Screening

Field screening provides a minimal level of data quality but yields the quickest results. Field screening of soil samples will be performed using a photoionization detector (PID) to provide a semi-quantitative measure of vapor-phase, VOCs; and, a multi-gas meter to provide a semi-quantitative measure of hydrogen sulfide. A PID with an 11.7 eV bulb will be utilized to detect on-site organic vapor concentrations. The PID will be the MiniRAE 2000 or an equivalent. The PID shall be maintained, calibrated, and operated in accordance with the manufacturer's operating procedures manual. The PID shall be operated in the continuous monitoring mode to determine if hazardous levels are present. A combustible gas indicator (CGI), such as the Scott SCOUT or an equivalent, will be used to detect the on-site presence of combustible gases. The CGI may be used near the ground surface during soil sampling and will be operated in a continuous operating mode.

A particulate air monitor, such as the TSI DustTrak™ 8520 Aerosol Particulate Monitor or equivalent, may be used to detect the presence of particulates, as part of the Community Air Monitoring Program. The particulate air monitor will be set up at one upwind (background) and one downwind location, at heights approximately 4 feet to 5 feet above land surface (i.e., the breathing zone) and will be operated in a continuous operating mode.

All action levels are based on worker breathing zone measurements, including intermittent and sustained readings.

Substance	Action Level	Response
Organic Vapors (PID)	0 to 10 ppm above ambient	Normal Operations
	>10 ppm above ambient	Stop work until concentrations are below 10 ppm
Combustible Gas (CGI)	<10% LEL	Continue work
	>10% LEL	Stop work, evacuate area, monitor
Particulate Air Monitoring	100 $\mu g/m^3$	Initiate dust suppression techniques

The field measurement equipment currently anticipated to be used on this project is a PID. The specific model of the PID will be selected to ensure the best possible response to the contaminants of concern at the site. While the PID screening provides neither definitive identification nor quantification of contaminants or their absolute concentrations, it does provide relative quantification and allows for the rapid processing of samples. Precision (percent difference) and accuracy (detection limit) objectives for this method are based on instrument calibration. The percent difference (%D) should be ±10% of the calibration standard. The detection limit (DL) is 2 parts per million (ppm).

5.6.2 Instrument Calibration

Instruments requiring calibration shall be calibrated according to their respective manufacturer's specifications, be given an operational check, and be calibrated prior to assignment to a project. Only qualified individuals, knowledgeable in the proper procedures, are permitted to perform instrument calibration. It is the responsibility of the equipment operator/user to ensure that all instruments in their control have been calibrated and are given an operational check prior to field use.

Calibration frequencies and procedures used shall follow the manufacturer's specifications. All calibration activities shall be documented to ensure compliance with applicable regulatory standards, and with the requirements of this project. Proper and timely documentation is the responsibility of the person(s) performing the calibration. These records shall be updated and maintained for at least the life of the instrument. Any equipment maintenance efforts also shall

be documented.

Upon use and task completion, the user/operator is required to document any problems or malfunctions noted while using an instrument. This information shall be provided in a memorandum to the field staff and GF Project Manager and should include at a minimum the following:

- The user/operator's name, office location, and telephone number.
- Identification of the instrument by serial number and company tag number (when available), manufacturer, and model.
- Provide the project job number and name for which the instrument was used.
- Provide a detailed description of the circumstances when the problem was encountered including a clear and complete description of the problem or malfunction, activities or environmental conditions which may have contributed to the problem, and any other information which might assist the Equipment Manager to repair the instrument and ensure it is in proper and safe operating order prior to future use (particularly important when an intermittent problem was encountered).

This information shall be used to inspect, repair, and/or maintain instruments.

5.6.3 PID Calibration

The PID will be calibrated prior to use, at least once during use, and checked at the end of the day following the manufacturer's instructions. In addition, the following steps will also be taken:

1. Calibrate the PID to zero air, which contains no ionizable gases or vapors.
2. Calibrate the PID to a calibration gas, which contains 100 ppm isobutylene. Standard variance (+/- %) will be noted in the calibration notes.

Operational check:

1. While in use, periodically check the calibration by supplying the instrument with a calibration gas.
2. Perform a post-calibration check at the end of the day by supplying the instrument with a calibration gas and record all findings.

5.7 Field Data Log Book

All field notes/activities will be recorded in a field data logbook that is dedicated to the event or site, bound and properly identified and dated. At a minimum the following information should be recorded on a daily basis in the logbook:

- Objective
- Personnel on-site
- Daily health and safety briefing
- Weather
- Starting and ending of all tasks completed each day
- Borehole logging information (if pertinent)
- Information pertinent to endpoint sampling/sampling for disposal purposes (if necessary)
- Maps showing proposed surface and subsurface endpoint soil sample locations, and other referenced features
- Equipment used on-site
- Equipment calibration information

5.8 Corrective Actions

When a significant condition adverse to quality is noted in the field or at the laboratory, the cause of the condition will be determined and corrective action taken to preclude repetition. Condition

identification, cause, reference documents, and corrective action to be taken will be documented and reported to the appropriate individuals. Implementation of corrective action is verified by documented follow-up action.

Acceptance limits for sampling and chemical analysis during this project will be consistent with those stated in the methods or defined by other means in other sections. Corrective actions are often immediate in nature and require implementation by the analyst, sampling personnel, or the GF Project Manager. The corrective action implemented immediately may involve re-calculation, re-analysis, or re-sampling. Long-term corrective action may be identified through analysis of performance evaluation samples, standards, and control charts. In either case, the corrective action taken must be properly documented.

All items requiring corrective action for field activities will be reported to and approved by the GF Project Manager. All items requiring corrective action for laboratory activities will be reported to and approved by the Project Manager. All submitted corrective action reports will be maintained by the Project Manager in the project file, and will be made available to the NYSDEC upon request.

5.8.1 Immediate Corrective Action

If an immediate corrective action can be taken, as part of normal operating procedures, the collection of poor quality data may be avoided. Instrument and equipment malfunctions are amenable to this type of action. The corrective actions taken will be noted in field or laboratory notebooks, but no other formal documentation is required, unless further action is necessary.

Corrective action during the field sampling program is most often due to equipment failure or a sampler-type error and may require that the sample be re-analyzed. Sampling oversight will be avoided by having field personnel audit each other's work prior to and after sample collection. Every effort will be made by the field team to ensure that all QC procedures are followed. Problems not solvable by immediate corrective action will be defaulted to a formalized long-term corrective action program.

Procedures for implementing immediate corrective action for analytical work will be based on procedures outlined in the laboratory's QA plan.

5.8.2 Long-Term Corrective Action

Long-term corrective action can be identified by SOPs, control charts, or performance and system audits. Any problem that cannot be resolved by immediate corrective action falls into the long-term corrective action category. It is essential that the data quality problem is reported to the person responsible for correcting it.

The following are essential steps in the corrective action program:

- Identify and define the problem;
- Assign responsibility for investigation of the problem;
- Investigate and determine the cause of the problem;
- Determine a corrective action to eliminate the problem;
- Assign and accept responsibility for implementing the corrective action;
- Establish effectiveness of the corrective action and implement the corrective action; and,
- Verify that the corrective action has eliminated the problem.

Documentation of the problem is essential to the system. Whenever a data quality problem is discovered, the person identifying the problem must document the problem, list possible causes, identify the person(s) responsible for the problem, and describe the corrective action that will be taken. The Project Manager, or designee (for field issues), and the laboratory QA Manager (for laboratory issues) will make checks to ensure that initial action was taken and that it appears effective and, at a later date, will check again to see if the problem has been fully resolved. All submitted corrective action reports become an integral part of the project files, and will be made available to the NYSDEC upon request.

6.0 ANALYTICAL PROCEDURES

Soil samples will be analyzed by Test America, a New York State Department of Health (NYSDOH) ELAP-certified laboratory. Test America must maintain current New York State Department of Health (NYSDOH) certifications during the project. Sample analysis will be performed primarily using methodology contained in *Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Office of Solid Waste, EPA 1986 (with updates).* Additional methodology is contained in *Methods for the Evaluation of Water and Waste, EPA 600/4- 79-02, revised March 1983 (with updates).*

All analyses will be performed in accordance with the EPA protocol established for the specified analyses. The specific parameters, quantitation limits, and analytical methods to be used for analysis of the samples will be provided in the Remedial Action Work Plan.

7.0 DATA REDUCTION, VALADATION, USABILITY, AND REPORTING

Data collected during the soil sampling activities, including field and laboratory results, will be reduced, reviewed, summarized, and reported. The reduction of the field data will consist of summarizing the raw field data, which may be presented in the form of tables, logs, illustrations, and graphs, as deemed appropriate by the Project Manager. The laboratory data will also be reduced and tabulated electronically. The data will then be suitable for inclusion in reports and will be designed to facilitate comparison and evaluation of the results.

The data package provided by the laboratory will meet the specifications of a full ASP Category B deliverable package. The methods and data packages provided by the laboratory will be consistent with the specifications of the most current version of the ASP. A NYSDEC Data Usability Summary Report (DUSR) will be prepared by a qualified chemist.

7.1 Data Review, Validation, and Verification Requirements

The analytical data generated during the Remedial Action activities will be subjected to validation and usability review to verify that they satisfy project objectives. The validation and usability review procedure is based upon EPA Region II RCRA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Data Validation SOPs that will consist of:

- Comparison of the lab sample description and case narrative in the laboratory data report to the chain-of-custody form to identify potential issues related to sample handling, preservation, and technical holding times;
- Evaluation of the results of field/equipment blank, trip blank, and method blank analyses to provide information concerning contaminants that may have been introduced during sampling, shipping, or analysis;

- Comparison of method specific instrument calibration, precision, and accuracy data with required QC limits;
- Evaluation of matrix effects on method performance to determine whether results have been biased high or low due to sample matrix interference; and,
- Comparison of data to relevant comparative criteria governing the management of contaminated environmental media (i.e., NYSDEC) to verify that appropriate method reporting limits were achieved.

The criteria to be used for the validation and usability review procedure are: 1) the specific performance requirements and QC protocol for each analytical method; and, 2) the relevant NYSDEC guidelines. The findings of the validation and usability review for each sample delivery group will be summarized on a checklist/summary form derived from a collection of SOPs for organic and inorganic data validation, which have been modified and adapted to incorporate method specific laboratory QC criteria established by the project laboratory.

7.2 Validation and Verification Procedures

As analyses are completed, electronic data deliverables (EDD) of laboratory results will be sent to the data manager for initial entry into the Remedial Action Work Plan sample database. The data manager receives complete sample delivery group (SDGs) from the laboratory and copies will be forwarded to the data reviewer. The data validation procedure will include the examination and comparison of laboratory SDG data reports to predefined criteria using the laboratory data review checklist/validation summary (checklist) to document and summarize the findings.

The matrix specific checklist contains a sample COC section, sections for each analysis, and a data quality summary table. Each section contains questions, method specific performance criteria, and blanks to record QC sample data information, where necessary. The validation procedure will consist of reviewing the SDG to complete all of the questions, recording QC

sample data where required, and completing the data quality summary table with data qualifiers for the analysis performed on each sample.

Instances of non-conformance with specified criteria identified on the checklist will be reviewed to determine if the data are suitable for the intended project objectives. Depending on the severity of nonconformance with the specified criteria, resolution of identified issues, and effect on data usability, data will be validated as *accept, qualify, or reject*, as follows:

A= Accept data with no issues or minor considerations that have no effect on data usability

Q= Accept data but qualify results as estimated values due to issues which have only a minor effect on data usability (e.g., blank contamination, poor MS/MSD recoveries and relative percent differences [RPDs])

R= Reject data as unusable for project objectives based on issues that have a major impact on data usability (e.g., severely missed holding times, high reporting limits, very low surrogate or spike compound or laboratory control sample analyte recovery, or a combination of several issues)

If necessary, the data reviewer will contact the laboratory project manager or the field team leader to clarify and resolve identified issues associated with sample collection or analyses. If corrective measures are warranted to address the identified issues, actions will be taken by the Project Quality Manager to authorize and document the necessary measures with the laboratory Project Manager or field team leader. These measures may include modifications to sample collection and handling procedures or analytical methodology.

Completed laboratory data review checklist/validation summary forms for each SDG will be returned to the data manager for use in qualifying data in the project sample database. Validated data that are acceptable for use will be documented as conforming to the project objectives, and be used in the project sample database without qualification. Samples for which data are not

acceptable (i.e., rejected) or samples for which no data were generated (i.e., due to breakage, errors, etc.) will be flagged as such in the Miscellaneous Notes field of the Final Engineering Report.

7.3 Reconciliation with User Requirements

Data from the Remedial Action sample database will be reviewed and assessed in the preparation of the Final Engineering Report that will serve as the close-out documentation for the completion of the NYSDEC-approved remedial action for the contaminated media at the 202-218 Morgan Avenue site. The report will include a discussion of analytical data quality and describe any limitations on the use of the data with respect to the final remedial action for the site.