EBIZNEWDOC

EBIZNEWDOC

Write or Copy/Paste Document Title In This Space

WorkPlan.HW.734043.2013-05-15.Sanders_Creek_Sediment_Sampling_WP.PDF

DO NOT PHOTOCOPY. PRINT FROM PDF VERSION ONLY.

EBIZNEWDOC

EBIZNEWDOC

SANDERS CREEK SEDIMENT SAMPLING WORK PLAN

CARRIER THOMPSON ROAD FACILITY
CARRIER PARKWAY
SYRACUSE, NEW YORK

EnSafe Project Number
13925

Revision: 0

Corrective Action Order — Index CO 7-20051118-4

Prepared for:

UTC Shared Remediation Services
United Technologies Building
Hartford, Connecticut

Prepared by:

EnSafe Inc.
220 Athens Way, Suite 410
Nashville, Tennessee 37228
(615) 255-9300
(800) 588-7962
www.ensafe.com

Table of Contents

List of Figures

List of Appendices

1.0 INTRODUCTION

Carrier Corporation (Carrier), a wholly-owned subsidiary of United Technologies Corporation (UTC) has prepared this work plan in advance of Remedial Action Plan (RAP) implementation for Sanders Creek targeted to be initiated August 1, 2014, per EnSafe's April 12, 2013, Draft Schedule: Implementation of Remedial Action Plan for Sanders Creek letter. Comments, by the New York State Department of Environment and Conservation (NYSDEC) indicate previous polychlorinated biphenyl (PCB) concentrations of sediments in portions of Sanders Creek previously assessed in October 2009, are no longer valid due to age of the samples.

To determine the extent of PCB concentrations of sediments within Sanders Creek prior to implementing corrective actions, Carrier will sample sediments in Sanders Creek upstream of the Carrier facility starting west of Sanders Creek Parkway where the creek emerges from a culvert continuing downstream from the site to the creek's confluence with the South Branch of Ley Creek. Information gathered will be used to revise the *Sanders Creek RAP, April 2011*, which is targeted for resubmittal to NYSDEC in August 2013, per EnSafe's April 12, 2013, Draft Schedule: Implementation of Remedial Action Plan for Sanders Creek letter.

This work plan outlines the proposed assessment strategy, sampling, and analyses to be undertaken, and quality assurance procedures for sediment sampling activities. Goals for the assessment include the following:

- Assess existing PCB concentrations of sediments within Sanders Creek downgradient from Outfall 001 to the confluence with the South Branch of Ley Creek.
- Re-establish background PCB concentrations of sediments in the portion of Sanders Creek upgradient from the Carrier facility.
    - — Re-develop a Clean-up Objective for RAP corrective action measures based on updated background PCB sediment concentrations.
- Identify potential Sediment Management Units (SMUs) throughout Sanders Creek from Outfall 001 to its confluence with the South Branch of Ley Creek.
- Calculate the existing quantity of sediment from Outfall 001 to the confluence with the South Branch of Ley Creek in order to estimate waste volumes prior to implementation of RAP corrective action measures (dredging).

The background of work previously conducted can be found in the previously submitted *Sanders Creek Sediment Sampling Report And Basis For Establishing PCB Cleanup Objective (Down-Gradient From Court Street To Confluence With Ley Creek; Up-Gradient From Carrier Facility Eastern Boundary To Sanders Creek Parkway),* December 2009.

2.0 ASSESSMENT STRATEGY

2.1 Sediment Sampling

Carrier proposes to sample sediment in Sanders Creek upgradient and downgradient from the Carrier facility as well as across the north portion of the Carrier property (Figure 1). Areas of collection for sediment samples will focus on the depositional environment of the stream. Additional samples will be collected immediately adjacent or downgradient of all current outfalls and where soils or sediments suggest evidence of impacts from outfalls (e.g., staining, odor). Composite samples will be collected in stream locations of ponded or slow moving water. In order to gain a representative sample set over the entire interval of stream, grab samples also will be collected on stream bars in areas of sediment deposition where the stream channel is more lenticular and water is moving faster, and in other areas of the stream based on in-field observations of the sampling personnel. Composite sediment samples from two to three locations within a 5-foot radius will be collected from the 0- to 6-inch depth interval and analyzed for Total PCBs and Total Organic Carbon (TOC). If accumulated sediment is encountered at depths greater than 6 inches (based on visual observations), additional sediment samples will be collected from the 6-inch to 12-inch interval and from each one-foot sediment interval beyond. The first 0- to 6-inch natural soil interval underlying depositions will also be sampled, and will continue every foot in soil if visual evidence of impact exists.

The total distance of the proposed sampling areas is approximately 8,900 feet. The number of data collection locations proposed will be appropriate to gather information concerning the current concentrations of PCBs in the creek sediment. Sanders Creek flows through culverts at points along the total length proposed for sampling. Sediments inside the culverts will not be sampled due to health and safety concerns. However, a sediment sample will be collect at the entry and exit of the culvert.

The following areas are proposed for sampling, and are depicted on Figure 1:

- Area 1: Upgradient of the Carrier property, from west of Sanders Creek Parkway where the creek emerges from a culvert downstream to east of the Sanders Creek confluence with the Kinne Street ditch (estimated 12 samples). These samples will be used to calculate a background threshold value (BTV) that will be used to establish the remedy Cleanup Objective.

- Area 2: This area is the section of Sanders Creek that is along Carrier's northern boundary, from the Kinne Street ditch to the culvert that passes under Thompson Road. (estimated 12 samples).

- Area 3: This section of Sanders Creek is downgradient of the property boundary, from the Thompson Road culvert to Sanders Creek confluence with the South Branch of Ley Creek. (estimated 14 samples).

Legend

Proposed Sediment Areas - Number of Sample Locations To Be Determined in Field

- Area 1 - Estimated 12 Sampling Locations
- Area 2 - Estimated 12 Sampling Locations
- Area 3 - Estimated 14 Sampling Locations

0 200 400 600 800 1,000 Feet

Aerial Photographic Source: NYS Office of Cyber Security & Critical Infrastructure Coordination April 2009

FIGURE 1
SANDERS CREEK PROPOSED SEDIMENT SAMPLING LOCATIONS
CARRIER FACILITY, THOMPSON ROAD
SYRACUSE, NEW YORK

REQUESTED BY:	S. Goodnight
DRAWN BY:	N. Rinehart
DATE:	05/02/2013
PROJECT NO:	0888808838

ENSAFE
1-800-588-7840
WWW.ENSAFE.COM

X:\UTC\Syracuse\Carrier Campus\Projects\Sanders_Creek_Sediment_Sampling_sg.mxd

2.1.1 Sediment Sample Collection Methods

Sediment samples will be collected from each location using stainless-steel spoons, trowels, or hand augers. For each sampling location a sample from the 0- to 6-inch interval will be collected. In the event that a sample cannot be obtained from the 0- to 6-inch interval at the designated sampling location due to safety concerns (e.g. steep banks, fast moving water), an alternate, adjacent sampling location (within 20 feet of the original location if practical) will be chosen and sampled. If accumulated sediment is encountered at depths greater than 6 inches, additional sediment samples will be collected from the 6-inch to 12-inch interval and from each one-foot interval beyond.

All samples will be homogenized by mixing the sampling interval in a stainless-steel bowl prior to placing the representative sample in the laboratory-supplied sample jar. A two-person field crew is required for health and safety reasons as well as for documentation purposes. One person will collect the samples and the other will properly document sample location and sample character (color, grain size, etc.) and will provide sample containers and chain of custody for the sampling event. No field screening will be performed for this event. Sample locations will be located via a global positioning system (GPS) capable of measuring points to an accuracy level of at least 30-inches. Sample locations will not be surveyed during this sampling event.

Additional information on the sediment sampling procedures is included in the Quality Assurance Project Plan - Attachment A.

2.1.2 Sample Analysis

Samples collected will be analyzed for Total PCBs using U.S. Environmental Protection Agency (USEPA) Method 8082, TOC using the Lloyd Khan Method. Additionally, grain size analysis will also be performed. Samples will be analyzed by TestAmerica Laboratories in North Canton, Ohio, which holds a New York State analytical laboratory certification.

2.1.2 Calculation of Sediment Amounts

In order to estimate wastes to be generated during planned RAP corrective action measure actions, the amount of sediment within the corrective action area will be calculated by collecting sediment depth measurements at 100-foot intervals from Outfall 001 to the Sanders Creek confluence with the South Branch of Ley Creek. At each assessment interval, the following measurements will be collected: creek width (top of bank and creek bed) and cross-sectional sediment depths.

2.1.3 Documentation

All notes, descriptions, and observations will be recorded in a project field logbook.

2.1.4 Equipment Decontamination

Before each sample is collected, all small sampling and downhole (intrusive) equipment will be decontaminated manually in accordance with the following procedures:

- Wash equipment with tap water and laboratory (phosphate-free) detergent using a brush, if necessary, to remove particulate and surface film
- Rinse with tap water
- Rinse with distilled water
- Air dry
- If necessary, wrap in aluminum foil to prevent recontamination prior to use
- Decontamination rinsates will be disposed by pouring directly into Carrier's on-site water treatment system.

3.0 HEALTH AND SAFETY PLAN

All sediment sampling field activities will be conducted in compliance with the site-specific health and safety plan.

4.0 IMPLEMENTATION SCHEDULE

The schedule for the activities outlined in this work plan will follow the Draft RAP Implementation Schedule submitted to the Department on April 12, 2013.

Attachment A
Quality Assurance Project Plan

Quality Assurance Project Plan
Sanders Creek Sediment Sampling
Carrier Thompson Road Facility
Thompson Road, Syracuse, New York

EnSafe Project Number
0888813924

Prepared for:

UTC Shared Remediation Services
United Technologies Building
Hartford, Connecticut 06010

Submitted by:

EnSafe Inc.
220 Athens Way, Suite 410
Nashville, Tennessee 37228
(615) 255-9300
(800) 588-7962
www.ensafe.com

May 2013

A-1 TITLE SHEET

Quality Assurance Project Plan
Sanders Creek Sediment Sampling
Carrier Thompson Road Facility
Thompson Road, Syracuse, New York

Submitted To:

UTC Shared Remediation Services
United Technologies Building
Hartford, Connecticut 06010

Submitted by:

EnSafe Inc.
220 Athens Way, Suite 410
Nashville, Tennessee 37228
(615) 255-9300
(800) 588-7962

www.ensafe.com

May 2013

A-2 TABLE OF CONTENTS

Figures

Tables

ENSAFE

A-3 DISTRIBUTION LIST

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

John Wolski —Project Manager, United Technologies Corporation, Hartford, Connecticut

Nelson Wong — Carrier Thompson Road Facility EH&S Manager, Syracuse New York

Craig Wise, PE — Program Manager, EnSafe Inc.

May M. Heflin, PE — Project Manager, EnSafe Inc.

Shane Goodnight, PG — Project Geologist, EnSafe Inc.

Anne Kathain — QA Manager, EnSafe Inc.

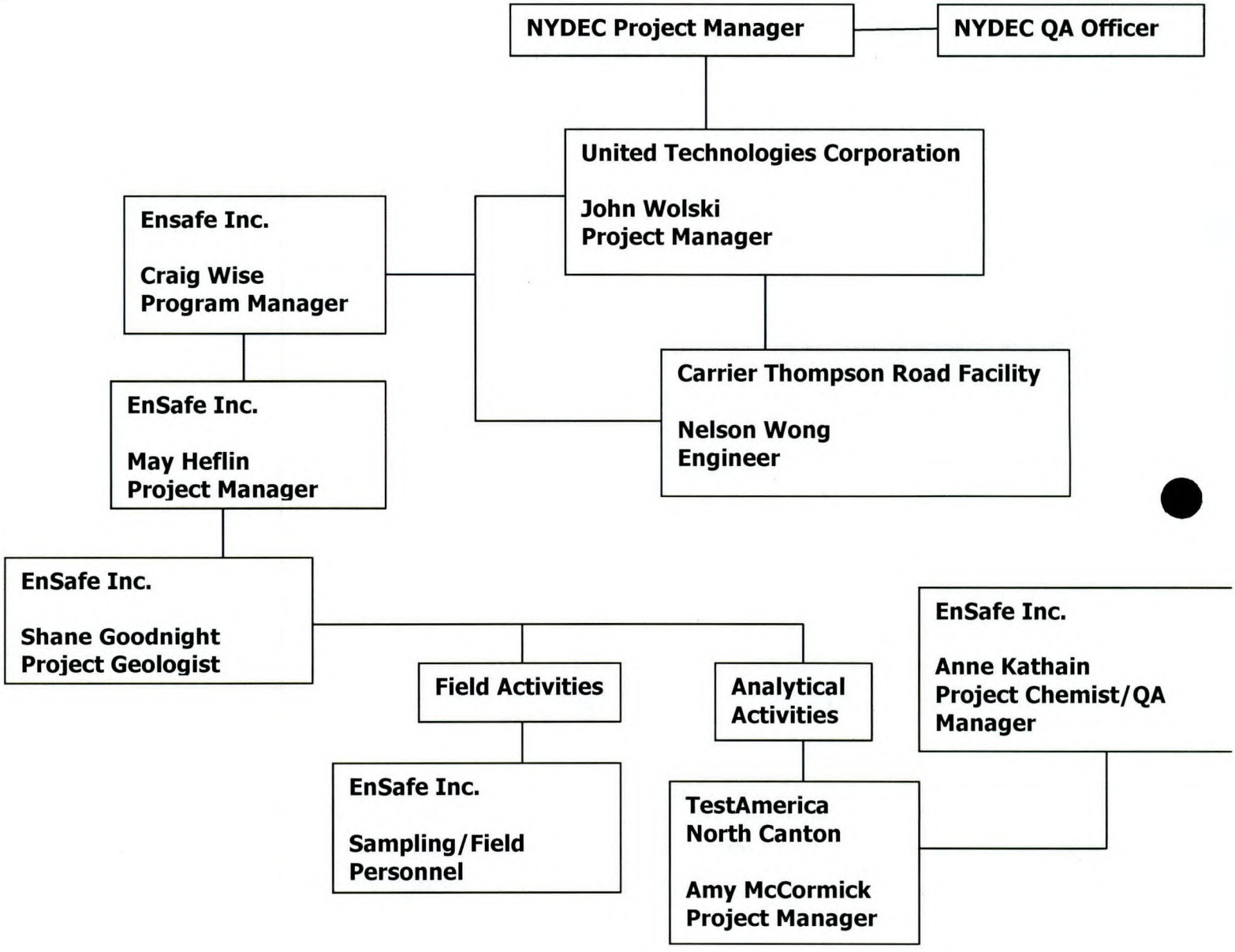
New York State Department of Environmental Conservation (NYSDEC) Project Manager

A-4 PROJECT/TASK ORGANIZATION

This QAPP documents the planning, implementation, and assessment procedures for sampling sediment in Sanders Creek in the vicinity of the Carrier Corporation Thompson Road facility, Syracuse, New York. Site information and requirements for sediment sampling are outlined in the NYSDEC Consent Order CO 7-20051118-4 (the order) of February 13, 2006.

This QAPP addresses sediment sample collection activities to be conducted in the vicinity of the site, as required by NYSDEC, which will be conducted by EnSafe Inc. personnel. The laboratory analyses will be conducted by a laboratory certified by the New York State Department of Health. Figure 1 is a project organizational chart that outlines the specific organization of this project.

Figure 1 Project Organization



As UTC's subcontractor for this project, EnSafe Inc. will be responsible for implementing the project. The EnSafe Project Manager, May Heflin, is responsible for project implementation and has the authority to commit the resources necessary to meet project objectives and requirements. The Project Manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully and will also be responsible for maintaining the official, approved QAPP. The Project Manager will work closely with the EnSafe Project Geologist, Shane Goodnight, to see that project tasks are appropriately completed. The Project Manager will primarily be responsible for all EnSafe Inc. project activities. The EnSafe Program Manager, Craig Wise, will also report directly to UTC and will provide the major point of contact and control for matters concerning the project. The EnSafe Quality Assurance (QA) Manager, Anne Kathain, will be responsible for ensuring that all EnSafe procedures for this project are being followed. The QA Manager, who is independent of data generation activities, will be responsible for the adherence to all quality assurance/quality control (QA/QC) as defined in the QAPP and will recommend and implement corrective measures and perform audits for proper performance and compliance with the QAPP, as necessary. The EnSafe field technical staff for this project will be drawn from EnSafe's pool of corporate resources. The technical team will be utilized to gather and analyze data and to prepare various task reports and support materials. All of the designated technical team members are experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

The laboratory subcontractor, TestAmerica North Canton will be responsible for furnishing all equipment, supplies, and personnel needed to accomplish the analytical requirements specified in this QAPP. The contracted laboratory will be approved and Certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP).

A-5 PROBLEM DEFINITION/BACKGROUND

A 1997 RCRA Facility Assessment Report (RFA) summarized a visual site inspection in which 17 Solid Waste Management Units (SWMUs) and two Areas of Concern (AOCs) were identified at the Thompson Road facility. AOC E, identified by the NYSDEC during the RFI process, included the polychlorinated biphenyls (PCBs) found to occur in Sanders Creek.

This QAPP documents how specific QA/QC activities will be applied during the sampling activities to be conducted at AOC E – PCBs in Sanders Creek. The purpose of this sampling is to determine the current concentrations and extent of PCBs in sediment in Sanders Creek upstream starting west of Kinne Streeet where the creek emerges from a culvert continuing downstream from the site to the creek's confluence with the South Branch of Ley Creek in advance of the implementation corrective

action measures (dredging). To this end, this QAPP defines the minimum field and laboratory QA, and the methodological and reporting requirements to be used for this project, as specified in the Carrier order as well as the NYSDEC Program Policy DSHM-HW-05-15, *Quality Assurance Project Plans.* This QAPP has been prepared in accordance with the specifications of *EPA Requirements for Quality Assurance Project Plans,* (United States Environmental Protection Agency [USEPA], March 2001).

A-6 PROJECT/TASK DESCRIPTION

The purpose of this sampling is to determine the current concentrations and extent of PCBs in sediment in Sanders Creek upstream and downstream from the facility. Sediment from up to 12 locations within Sanders Creek upstream of the facility and 26 locations within Sanders Creek downstream from the facility will be sampled. The number of samples may vary depending on field conditions at the time of mobilization. Sediment samples will be collected from accessible areas of Sanders Creek downstream from the site at the creek's confluence with the South Branch of Ley Creek. Sediment sampling will move upstream toward the facility ending just west of Kinne Street where the creek emerges from a culvert. All sediment samples collected will be analyzed for PCBs and the data collected will be used to comply with the specifications of the order.

Sanders Creek Sediment Sampling Locations

Figure 1 of the *Sediment Sampling Work Plan (May 2013)* shows the proposed sediment sampling locations.

A-7 QUALITY OBJECTIVES AND CRITERIA

The overall QA objective for this project is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide results that are scientifically valid at levels that are sufficient to meet data quality objectives (DQOs). Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal QC, preventive maintenance of field equipment, and corrective action are described in sections of this QAPP.

In combination, QA/QC represents a set of procedures designed to produce analytical data of known and measurable quality. A useful distinction between QA and QC can be made as follows: QC represents the set of measurement procedures (spikes, blanks, replicates, calibration, etc.) used to provide overall evidence of the quality of a particular analytical batch; QA represents the set of procedures used to ensure that this evidence is available and used properly to evaluate and, if necessary, to qualify the data quality.

A-7.1 Data Quality Objectives

The QA objectives during the site-wide monitoring will be to ensure that the data meet the DQOs which were developed for the Carrier facility to ensure data of known and acceptable quality are produced to comply with the order. The following sections describe the DQO process for the site-wide monitoring.

A-7.1.1 State the Problem

PCB-impacted sediment has been identified in Sanders Creek as it flows along the northern boundary of the Carrier facility, down to and just beyond Mautz Road. A corrective action (dredging) has been approved by the NYSDEC, pending resampling of the creek sediments due to the age of previously collected sediment samples upstream and downstream of the facility (October 2009 and earlier). Prior to implementing the corrective measure, Carrier is extending the sediment sampling study area in Sanders Creek to its confluence with the South Branch of Ley Creek, so that future nature and extent investigations are not required after a corrective action has been implemented. This DQO process discusses the objectives that must be met to identify the extent of contamination in Sanders Creek and to comply with the NYSDEC order.

A-7.1.2 Identify the Decision

Analytical data obtained from sediment samples from Sanders Creek will be provided to the NYSDEC to:

- Determine the current concentrations and extent of PCBs in sediment in Sanders Creek downstream from the facility.

- Re-establish a background PCB concentration for sediment in Sanders Creek upstream from the facility.

A brief summary of the investigative areas, the objectives for each area and the investigative approach are provided in Table 1.

A-7.1.3 Identify Inputs to the Decision

Inputs include analytical results and regulatory guidance. Table 1 provides the reporting limits and analytical site screening objectives for sediment analysis. To assess whether PCBs are migrating to Sanders Creek, the remedial goal for the source area is that significant levels of PCBs are no longer migrating through the storm sewers, per the NYSDEC order.

Table 1
Data Quality Objective Summary

SWMU or Investigation Area	State the Problem	Identify the Decision	Define the Study Boundaries
Sediment in Sanders Creek (AOC E)	In 2000 and 2001, sampling results for sediment and crayfish samples taken upgradient and along the facility boundary indicated PCBs, attributable to the Carrier facility are present at levels of concern and that PCBs are bioavailable. Results from sediment samples previously collected in Sanders Creek upgradient from and along the facility's northern boundary are assumed to be viable. Sediment samples from the 0 to 6 inch interval will be collected downstream from the Thompson Road culvert/bridge. A corrective measure (dredging) has been approved for the studied area, pending resampling of the creek sediments due to the age of previously collected sediment samples upstream and downstream of the facility (October 2009 and earlier).	Prior to implementation of corrective action, NYSDEC has requested Sanders Creek be re-assessed to determine the current concentrations and extent of PCB impacted sediments downstream from the facility. Additionally, sediments upstream from the facility will be assessed in order to re-establish background PCB concentrations. The remedial goal for the source area is that significant levels of PCBs are no longer migrating through the storm sewers, and subsequently into Sanders Creek.	Sediment samples will be collected from accessible areas of Sanders Creek upstream from the facility starting west of Sanders Creek Parkway where the creek emerges from a culvert continuing downstream from the site to the creek's confluence with the South Branch of Ley Creek. Depositional areas within the creek, along the water's edge, and in the immediate area of the creek channel will be chosen for sampling. Depositional areas adjacent to outfalls will also be sampled. Carrier will conduct the downstream sediment sampling in Sanders Creek so that the corrective action measure implemented will target those areas believed to be affected by PCBs emanating from the Carrier facility.

A-7.1.4 Define the Study Boundaries

Sediment sample locations in each investigative area were based on previous investigations. Proposed sediment sample locations are shown on Figure 1 of the work plan.

A-7.1.5 Develop a Decision Rule

Information obtained during re-assessment activities will be used to revise the Remedial Action Plan and the subsequent NYSDEC approved corrective measures will be implemented.

A-7.1.6 Specify Limits on Decision Errors

- The null hypothesis is that each of the areas investigated (or to be investigated) is not contaminated. Sampling and analyses was/will be performed based on historical uses in the area. This sampling and analysis was/is performed to determine if contamination was/is present, and if found, the nature and extent of contamination was/will be determined.

- A sampling design error occurs when the data collection design does not capture the complete variability within the area of investigation to the extent appropriate for a decision to be made. This could potentially lead to the extent of contamination not being defined properly and/or corrective measures not adequately treating the true problem area.

- A false rejection decision error may occur if a limited amount of sampling and analysis is performed, causing a broader area of contamination to be outlined. This may result in additional expense related to corrective measures implementation.

While the possibilities of making decision errors cannot be totally eliminated, the occurrence of such errors can be minimized by developing better work plans.

A-7.1.7 Optimize the Design for Obtaining Data

The sampling plan for each area of investigation is based on reasonable sample numbers for the size used area. The analytical methods or analysis of the soil and groundwater samples are USEPA approved, definitive analytical methods, which satisfy the decision criteria (Step 5.5). The design has been and will be used to focus all sampling and analysis activities on the decision (Step 5.2) in an efficient and cost-effective manner.

A-7.2 Measurement Performance Criteria

Performance criteria selected for the analytical measurement systems will ensure the project objectives in Section A-7.1 are met. The following paragraphs provide performance criteria for the project specific analytical measurement systems.

A-7.2.1 Precision

Precision measures the reproducibility of measurements and methods, and is defined for qualitative data as a group of values' variability compared with its average value. To assess the precision of the measurement systems used in this project, sediment field duplicates will be obtained and analyzed with the samples collected. Precision of laboratory analysis will be assessed by comparing the analytical results between Matrix Spike/Matrix Spike and Duplicate Samples (MS/MSD). The relative percent difference (RPD) will be calculated for each pair of duplicate analysis using the following equation:

$$RPD = \frac{(S - D)}{(S + D) / 2} x\ 100$$

Where:

S = sample result
D = duplicate result

A-7.2.2 Accuracy

Accuracy is the degree to which a given result agrees with the true value. The accuracy of an entire measurement system is an indication of any bias that exists. Spiked sample results provide information needed to assess the accuracy of analyses. Specifically, surrogate spike, MS/MSD, and laboratory control sample (LCS) percent recoveries (%Rs) are used to assess accuracy. Every organic sample is spiked with known quantities of nontarget surrogate compounds. Five percent of all samples analyzed are spiked with target chemicals for the MS/MSD. If the calculated %Rs for the known spike concentrations are within defined control limits set by each method, the reported sample concentrations are considered accurate. Accuracy is calculated using the following equation.

$$\%R = \frac{(SSR - SR)}{SA} x100$$

Where:

SSR	=	spike sample recovery
SR	=	sample recovery
SA	=	concentration of spike added

A-7.2.3 Representativeness

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. Representativeness is a qualitative parameter which is dependent upon the proper design of the sampling program and proper laboratory protocol. The sampling approach was designed to provide data representative of site conditions and the number of sampling points was selected based requirements set forth in the order. During development of this approach, consideration was given to past waste disposal practices, existing analytical data, physical setting, and processes previously and currently used at the facility. The sampling approach was discussed in the Work Plan. Representativeness will be satisfied by insuring that, the Sediment Sampling Plan, QAPP, and USEPA protocols are followed, proper sampling technique are used, proper analytical procedure are followed, and holding times of the samples are not exceeded by the laboratory.

A-7.2.4 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability is also dependent on similar QA objectives. Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring proper sampling techniques are used.

The objective of this QA/QC plan is to produce a high level of comparability between data sets. Heterogeneous investigative samples make it difficult to obtain consistently high comparability values. However, the use of standard methods for sampling and analysis (USEPA protocols), reporting data in standard units, and using standard and comprehensive reporting formats will optimize the potential for high levels of data comparability.

A-7.2.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions. It is expected that 100% of the planned sampling points will be collected. All sediment sampling locations within Sanders Creek are expected to be accessible. The completeness goal for field measurements will be greater than 90%. Laboratory analysis for this project will have a completeness goal greater than 95% to account for unanticipated results that may be rejected during data validation. Completeness can be calculated using the following equation.

$$\%Completeness = \frac{No.\ of\ Valid\ Tests}{Total\ Tests\ Taken} x100$$

A-7.2.6 Sensitivity

Sensitivity is the measure of the concentration at which an analytical method can positively identify and report analytical results. The sensitivity of a given method is commonly referred to as the detection limit. Definitions for common detection limits are defined below.

- Method detection limit (MDL) is a statistically determined concentration. It is the minimum concentration of an analyte that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.

- Method reporting limit (MRL) is a multiple of the MDL and is regarded as the minimum level of target analyte in a sample that can be reliably achieved within specified limits of precision and accuracy. The MRL is variable and highly matrix-dependent.

The sensitivity goal (or MDL) for laboratory measurements reported for this project shall be lower than the NYSDEC remedial goal/criteria of 0.1 parts per million (ppm).

A-7.2.7 Summary of Matrix Types, Analytical Methods, and QA Targets

Table 2 summarizes the analytes, detection limits, and action levels for the Sediment Sampling Plan. Routine QA targets listed in the contracted laboratory's New York State approved Quality Assurance Plan (QAP) will be used to assess precision and accuracy of analytical data generated for this effort (Table 3). The QAP outlines the laboratory's capabilities, the routinely used QC measures, the routine QA targets for precision and accuracy, and all documentation, calibration and maintenance activities that are necessary to produce data of a known and acceptable quality.

ENSAFE

Table 2
Analytes, Detection Limits, and Action Levels

Chemical Abstract Services No	Analyte Name	Method Reporting Limit [a]	Method Detection Limit [a]	NYSDEC Standard [b]	Units
Sediment Samples					
12674-11-2	Aroclor 1016	33	21		µg/kg
11104-28-2	Aroclor 1221	33	16		µg/kg
11141-16-5	Aroclor 1232	33	14		µg/kg
53469-21-9	Aroclor 1242	33	13	1,000 [b]	µg/kg
12672-29-6	Aroclor 1248	33	17		µg/kg
11097-69-1	Aroclor 1254	33	17		µg/kg
11096-82-5	Aroclor 1260	33	17		µg/kg

Notes:

[a] Reporting limits and method detection limits for sediment samples were developed in 2013 by TestAmerica North Canton and are subject to change throughout the life of the project

[b]. New York State Department of Environmental Conservation recommended surface soil cleanup objective, Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels — TAGM #4046, January 24, 1994.

Table 3
Laboratory Accuracy and Precision Report

Chemical Abstract Services No	Analyte Name	MS/MSD Accuracy[a]	MS/MSD Precision[a]	LCS Accuracy	
12674-11-2	Aroclor 1016	22-157	30	62-120	
11104-28-2	Aroclor 1221	NA[b]	NA[b]	NA[b]	
11141-16-5	Aroclor 1232	NA[b]	NA[b]	NA[b]	
53469-21-9	Aroclor 1242	NA[b]	NA[b]	NA[b]	
12672-29-6	Aroclor 1248	NA[b]	NA[b]	NA[b]	
11097-69-1	Aroclor 1254	NA[b]	NA[b]	NA[b]	
11096-82-5	Aroclor 1260	13-161	30	56-122	
877-09-8	Tetrachloro-m-xylene				29-151
2051-24-3	Decachlorobiphenyl				14-163

Notes:

[a] MS/MSD accuracy and precision and LCS Accuracy for sediment samples developed by TestAmerica- North Canton in 2013 and are subject to change throughout the life of the project.

[b] Per Method 8082, precision and accuracy is performed for Aroclor 1016 and 1260 to represent all Aroclors.

A-8 SPECIAL TRAINING/CERTIFICATION

Sampling personnel will have current Hazardous Waste Operations and Emergency Response training/certifications as required by Title 29 Code of Federal Regulations 1910.120. Sample collection personnel shall be trained in proper sample collection methods.

A-9 DOCUMENTS AND RECORDS

The records for this project will include miscellaneous correspondence, field logs and field data worksheets, laboratory analytical reports, and draft and final reports. The final report will be submitted to UTC-Carrier, who will then submit the report to the NYSDEC project manager.

A field log will be maintained as the primary documentation of the actual site conditions and field activities. It will be maintained concurrently with the conduct of the field activities by the Project Coordinator or his designee. Specific information to be included in the field log includes:

- Date, time, and description of site conditions
- Date, time, and description of work activities
- Names of team members present
- Names, time of arrival, and time of departure of any visitors
- Number, type, date, time, and identification of any samples collected
- Records of field measurements, including calibration data and reference to corresponding sample identification numbers
- Health and Safety data, including site data (e.g. organic vapor, explosimeter, oxygen, etc. measurements), and any deviation from established standard operating procedures
- Any unusual circumstances, occurrences or QAPP deviations

The field log will consist of a bound, waterproof log book containing numbered pages. Entries will be made in the field log using waterproof ink. No pages will be removed from the field logbook for any reason. When corrections or revisions are necessary, these will be made by drawing a single line through the original entry in such a manner that the original entry remains legible. Corrections will then be made along side or above the original entry. All corrections and revisions will be initialed and dated by the individual making them. At the completion of the field activities, the field log will be returned to the Project Manager as a part of the permanent project record.

One laboratory analytical report will be generated for all the samples received by the laboratory. The analytical data report will include an original signed report of the analytical results, a narrative report about the analysis, original complete chain-of-custody forms, and any other documentation received with the samples. A summary of the calibration data, and laboratory QC data will also be included in the analytical report. The raw analytical data (e.g., instrument printouts and manual records) will be available to the NYSDEC upon request. The Project Manager shall retain copies of all analytical reports generated.

The Project Manager shall retain copies of all updates and revisions of this QAPP and disseminate updated versions, as appropriate. The Project Manager shall also retain copies of all sampling procedures and analytical procedures used for collection and analysis of project samples, and/or copies of all laboratory analytical reports and correspondence with the laboratories. In addition, the Project Manager shall retain copies of all management report and copies of all communications to and from outside agencies and other interested parties. All reports generated electronically shall be saved on EnSafe Inc.'s network, which is backed-up on a nightly basis.

B-1 SAMPLING PROCESS DESIGN

Sample collection points and a justification for these points are described in the Sediment Sampling Plan. The Sampling Plan provides more specific information regarding site history, rational, and sample locations. The following sections provide a summary of the sampling design for this project.

Schedule

Sediment sampling is proposed to be conducted in June of 2013.

Proposed Samples

Table 4 outlines the proposed samples and analytical methods for sediment samples collected. Sample locations and quantities were previously provided in Section A-6. Samples collected and submitted to the laboratory for analyses are critical in fulfilling the order.

Table 4
Proposed Critical Samples and Analytical Methods

Parameter	Analytical Method	Location to be Analyzed
Sediment Samples		
PCBs	SW-846 Method 8082	Approximately 12 sample locations in Area 1 shown in Figure 1. Approximately 12 locations in Area 2 shown in Figure 1. Approximately 14 locations in Area 3 shown in Figure 1.

Notes:
Analytical methods from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), Third Edition, Update III, (USEPA, December 1996).

B-2 SAMPLING METHODS

This section describes the data-collection requirements for groundwater and sediment monitoring activities.

Sediment Sampling Equipment

Table 5 details the field equipment that will be used to collect sediment samples within Sanders Creek.

Table 5
Sediment Field Sampling Equipment

Equipment Description	Use
Stainless steel trowels, spoons spatulas	Collect sediment for sampling
Stainless steel hand auger	Collect sediment for sampling
PVC or stainless steel poles	Collect sediment for sampling
Stainless steel mixing bowls	Composite sediment samples.

Sediment Sampling Procedures

Accumulated sediment will be sampled using stainless steel spoons or spatulas. The sediment in the 0 to 6-inch depth within five representative depositional environments (channels, bars, riffles, banks, etc.) in Sanders Creek will be collected. Each sampling location will be documented and photographed. Samples will be placed into a stainless steel bowl and homogenized prior to filling sample containers. After homogenization, sediment will be placed into one pre-cleaned and certified 4 or 8 ounce glass container with Teflon lid. Filled containers will be properly labeled and immediately placed into coolers and chilled.

B-3 SAMPLE HANDLING AND CUSTODY

Sample Handling and Management

Samples will be collected and preserved in certified, pre-cleaned containers provided by the contracted analytical laboratory. Table 6 shows the sample containers, preservation and holding times required for samples collected during this sampling effort.

Table 6
Sample Containers, Preservation, and Holding Times

Analytical Method	Matrix	Container Type	Sample Volume	Preservation	Holding Time
SW-846 8082	Sediment	glass (Teflon lined septum)	4 or 8 ounce	4°C,	Preparation within 14 days; Analysis 40 days after preparation

Sample Identification

All samples collected in the course of a project will be identified by a unique sample identification code. That identification code will be recorded on the sample label affixed to the sample container, in the field log and on the analytical chain-of-custody form. The sample identification code will be used to track each sample as well as cross-reference sample data with other activities.

A sample identification label will be affixed directly to each sample container to document activities associated with collection of that specific sample. Sample labels will be completed in waterproof ink at the time of sample collection by the individual(s) collecting the samples. Specific information to be recorded on each sample label includes the following information:

- Site name and location
- Date and time of sample collection
- Type of analysis to be performed

- Preservation
- Sample identification number

Packaging Samples

All samples must be packed so as to avoid breakage during transport and prevent cross-contamination. Samples should be packaged in a clean sample cooler in good condition. The samples will be wrapped in bubble wrap or other suitable packaging materials to prevent breakage and the containers inside the cooler will be packed such that the bottles will not touch each other. For sediment samples, cooling material (e.g., bagged ice, blue ice) will be placed around and between the samples to chill the samples to less than 6 °C. Any remaining space in the cooler will be filled with additional inert packaging material. A temperature blank will be included in each sample cooler. Each cooler will be sealed with tape and custody seals so that the cooler cannot be opened without breaking the seal.

Sample Custody

Custody is one of several factors that are necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for admissibility: relevance and authenticity. Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final evidence files. Final evidence files, including all originals of laboratory reports and purge files, are maintained under document control in a secure area.
A sample or evidence file is under your custody if:

- The item is in actual possession of a person
- The item is in the view of the person after being in actual possession of the person
- The item was in actual physical possession but is locked up to prevent tampering
- The item is in a designated and identified secure area

Field-Specific Custody Procedures

The field sampling team will be responsible for the care and custody of the collected samples until they are properly dispatched. The Project Coordinator will review all field activities to ensure/confirm that proper custody procedures are followed during the field activities. The Project Coordinator or field personnel will complete a chain-of-custody form to accompany each cooler shipped from the field to the laboratory. The following sections describe the specific field custody procedures.

Initiation of Chain-of-Custody Field Procedures

The laboratory, which is the source of the custody train, will provide pre-cleaned containers in accordance with USEPA bottle cleaning requirements. Bottle lot documentation, in the form of bar codes, is affixed to each bottle and is traceable throughout the containers' lifespan. Containers are sent into the field with chain-of-custody documentation which is kept with the containers during field efforts. The containers will remain in the custody of EnSafe during sampling and will be sent to the laboratory using the chain-of-custody procedures described in this section. The field sampler is personally responsible for the care and custody of the samples until they are transferred. The sampler will keep a written record of the sampling operation and the samples' identities. The sample packaging and shipment procedures summarized below will ensure that the samples will arrive at the laboratory with the chain of custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. As few people as possible should handle the samples.

- All bottles will be identified by use of sample labels with sample numbers, sampling locations, date/time of collection, and type of analysis. Sample labels are to be completed for each sample using waterproof ink unless prohibited by weather conditions. The label must remain legible and attached to the sample bottle, even when wet.

- Samples are accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to the permanent laboratory, or to/from a secure storage area.
- Samples will be properly packaged and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in each sample cooler. The original chain-of-custody form will accompany the shipment. At least one copy of the form will be retained by the sampler. Shipping containers will be locked and secured with strapping tape and custody seals for shipment to the laboratory.

- Ideally, samples will be transported to the laboratory the same day the samples are collected in the field by overnight carrier. In some instances, samples may be retained by the sampler beyond the sample collection day. In these instances, the samples will be

shipped and the laboratory will be informed, if necessary, so that sample-holding times will not be exceeded.

Official custody of samples must be maintained and documented from collection until completion of analysis. Chain of custody will be documented. The chain-of-custody procedures can provide an accurate record to trace a sample's possession and handling. Sampling personnel will record the following minimum information on the chain-of-custody form:

- Sample identification number and location
- Signatures of any individuals with control over samples
- Date and time of collection
- Any preservatives used in the samples
- Additional comments, (e.g., air-bill numbers, request for faster turnaround time)
- Total number of sample containers and the required analysis

Laboratory Chain-of-Custody Procedures

The laboratory sample custodian shall inspect the samples and record any problems encountered on the chain-of-custody form or internal laboratory "discrepancy report." The sample custodian shall inspect and record the following:

- Condition of shipping container
- Temperature of shipping container
- Condition of sample containers
- Condition (including presence or absence) of custody seals on shipping containers
- Presence or absence of chain-of-custody records
- Conflicting chain of custody and sample container information
- Preservation
- Resolution of problems or discrepancies (e.g., absent documents, conflicting information, broken custody seals, broken/leaking samples, etc.)

The sample custodian shall sign all chain-of-custody forms and discrepancy reports. The laboratory will contact the Project Coordinator, Project Manager, and/or QA Manager to resolve any discrepancies and/or problems upon sample receipt. Samples will be properly identified, logged in, and assigned the correct analyses. In addition, the sample chain of custody will be maintained during the sample receiving and analytical processes at all times.

The laboratory will have a specific method for maintaining identification of samples while they are in the laboratory, including sample containers, extraction/digestion vessel, and sample extract/digestate containers. The laboratory identifier shall be cross-referenced with the field sample identifier on the laboratory reports.

All samples will be maintained in a secure location and will be stored in appropriate areas to maintain proper preservation requirements. After sample analyses are complete, the laboratory may discard samples only with the concurrence of the Project Manager or as the contract stipulates. If sample is discarded, the time and date of disposal must be recorded. Analytical data is to be kept secured and released to authorized personnel only.

Final Evidence File Custody Procedure

The final evidence file will be the central repository for all documents that constitute evidence relevant to sampling and analysis activities as described in this QAPP. EnSafe Inc. will be the custodian of the evidence file and will maintain the contents of evidence files for the site, including all relevant records, reports, logs, field notebooks, pictures, subcontractor reports, and data reviews. The evidence file will be kept in a secured, limited access area that is under EnSafe Inc.'s custody. The final evidence file will include at a minimum:

- Field logbooks and other field records
- Field data and data deliverables
- Photographs
- Drawings
- Soil boring logs
- Laboratory data deliverables
- Data validation reports
- Data assessment reports
- Progress reports, QA reports, interim project reports, and all other reports generated
- All custody documentation (forms, air bills, etc.)
- Correspondence and other records relevant to the project

The evidence file will be maintained for a minimum of three years past the submittal data of the final report.

B-4 ANALYTICAL METHODS

Standard SW-846 sampling methods that have been evaluated and approved for use in complying with the RCRA regulations will be used to analyze both the sediment samples collected. These methods are specified in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), Third Edition Update III (USEPA, December, 1996). Table 7 outlines the methods to be used for the sampling. Non-critical field measurement methods and instrumentation was previously discussed in Section B-1.

Table 7
Laboratory Analytical Methods

Method	Application	Target Analytes
SW-846 8082 USEPA Region 1	PCBs by Gas Chromatography	PCBs

Notes:
SW-846 = *Test Methods for the Evaluation of Solid Wastes, SW-846,* Third Edition. (USEPA, December 1996). Office of Solid Waste and Emergency Response.
PCBs = Polychlorinated Biphenyls

A copy of the laboratory data in level "B" format will be provided in electronic format to the NYSDEC for review.

B-5 QUALITY CONTROL

Level of Quality Control Effort

Field QC samples will be collected at the specified frequencies stated in the following sections. Precision will be assessed by evaluating the results of the duplicate and matrix spike duplicate samples. Accuracy will be assessed by evaluating the analyses of the field blanks and equipment rinsate blanks (if collected). Table 8 lists the QA/QC samples that will be collected from each site during the sampling event. The types of QA/QC samples that will be utilized during the annual monitoring activities are discussed below.

Table 8
Quality Assurance/Quality Control Samples

Event	Site Area	QA/QC Samples
Sanders Creek Sediment Sampling	Up to 38 locations from Areas 1 through 3 (See Figure 1 of the Sanders Creek Sediment Sampling Work Plan).	2 Field Duplicate Samples 2 Matrix Spike/Matrix Spike Duplicates 1 Precleaned or Field-Cleaned Equipment Blank*

Table 8
Quality Assurance/Quality Control Samples

Event	Site Area	QA/QC Samples

* Precleaned or field-cleaned equipment will be collected one per sampling event. As such, a precleaned equipment blank will be collected if new, nondedicated equipment is used in the sample collection process. A field-cleaned equipment blank will be collected if any field decontamination is performed, with sampling equipment reused at a different sampling point.

Quality Control Samples

Quality control samples that are pertinent to this sampling effort are discussed below.

Precleaned Equipment Blanks

Precleaned equipment blanks monitor onsite sampling environment, sampling equipment decontamination, sample container cleaning, the suitability of sample preservatives and analyte-free water, and sample transport and storage conditions. A precleaned equipment blank will be collected on sampling equipment that has been brought to the site precleaned and ready for use. If equipment is not cleaned in the field, a precleaned equipment blank is not required.

Field-Cleaned Equipment Blanks

If equipment is not cleaned in the field an equipment blank is not required. Field-cleaned equipment blanks monitor onsite sampling environment, sampling equipment decontamination, sample container cleaning, the suitability of sample preservatives and analyte-free water, and sample transport and storage conditions. A field-cleaned equipment blank will be collected on sampling equipment that has been cleaned in the field (i.e., between sampling points) and reused at additional sample points.

Field Blanks

Field blanks monitor onsite sampling environment, sample container cleaning, the suitability of sample preservatives and analyte-free water, and sample transport and storage conditions. Prepare field blanks by pouring analyte-free water into sample containers for each parameter set to be collected. Field blanks are not required if precleaned or field-cleaned equipment blanks are collected.

Field Duplicate Sample

Field duplicate samples are field samples obtained from one location. They are divided into separate containers and are treated as separate samples throughout the remaining sample handling and analytical processes. Field duplicate samples are used to assess total error (precision) associated with sample heterogeneity, sample methodology, and analytical procedures.

Soil duplicate samples are homogenized in a precleaned intermediate vessel (e.g., mixing bowl prior to being split). Duplicates are collected, preserved, transported, and documented in the same manner as the samples. Different sample identifications are used for duplicates than for original samples.

Matrix Spike and Matrix Spike Duplicate Samples (MS/MSDs)

MS/MSD are environmental samples that are spiked in the laboratory with a known concentration of a target analyte(s) to verify percent recoveries. MS/MSDs are primarily used to check sample matrix interferences, precision, and accuracy. They can also be used to monitor laboratory performance. MS/MSDs are required to be performed by laboratories per the analytical methods at a frequency of 1 per 20 samples analyzed. Sediment MS/MSDs are collected using the same procedures for duplicate samples; however, triplicate volume is not required. MS/MSDs must be identified using the same identification as the parent sample and must be identified on the chain of custody to inform the laboratory that the sample is intended to be used for spiking. Samples chosen for spiking should be representative of the matrix indicative of site conditions. MS/MSDs should be collected, preserved, transported, and documented in the same manner as the samples.

Surrogate Spikes

Surrogate spikes are also used to determine the accuracy of the analytical method with respect to the matrix under investigation. Surrogate spike compounds are compounds similar in chemical nature to the target compounds, but would not be expected in affected media (i.e., radioisotopically labeled compounds, etc.). These compounds are introduced into each sample before analysis. By comparing the reported results for these compounds with the quantities introduced, a percent recovery can be determined. The percent recovery data are subsequently used to assess the accuracy of results for target compounds within each specific sample. Surrogate spike analyses will be performed by the laboratory on each sample analyzed for organic parameters, but extra sample volume will not be required.

Control Limits

Control limits are the maximum and/or minimum values defining a range for a specific parameter, as outlined within each analytical procedure, and are considered to satisfactorily meet QC criteria. When the parameter falls outside that range, the procedure is considered to be out of control. Formulas for calculating precision and bias associated with QC samples were previously described in Section A-7.2. These formulas will be used to assess whether precision and accuracy of analytical results are in control. Whenever the analytical procedure is or becomes out of control

which will render the results unusable, corrective action should be taken to bring the analysis back into control. The corrective action should include: (1) finding the cause of the problem, (2) correcting the problem, (3) demonstrating the problem has been corrected by reanalyzing appropriate laboratory reference samples, if necessary, and (4) repeating the analyses of any investigative samples that may have been affected by the control problem, if necessary.

Exceptions will be made, on a case-specific basis. If the control limit is technically impracticable for a particular sample or analysis, documentation and narrative explanation should be submitted with the data report and raw data. The documentation must include evidence that a good-faith effort was made to meet the control limit.

B-6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

Field measurement equipment will be checked for operation in accordance with the manufacturer's specifications. This includes battery checks, routine replacement of membranes, and cleaning of conductivity electrodes. All equipment will be inspected when first handed out and when returned from use for damage. Equipment used to gather, generate, or measure environmental data will be calibrated within the frequency stipulated by the manufacturer's instructions and/or analytical method in such a manner that accuracy and reproducibility of results are consistent. Prior to use, field-measuring equipment will be examined to certify that it is in operating condition. Field personnel will be responsible for inspecting equipment before use and they will follow the manufacturer's instructions for assembly, operation, and maintenance of field instruments and equipment. They will verify that the calibration requirements have been met for the instruments used and that all equipment is in proper working condition prior to use. The preventive maintenance of field equipment is described in detail in the associated manufacturer's equipment manuals. Records of equipment maintenance will be maintained by the field logbook. Maintenance records for leased equipment must be kept by the vendor and made available upon request.

Laboratory preventive maintenance will be implemented in accordance with the Laboratory QA Plan and associated Standard Operating Procedures (SOPs). At a minimum, all major instrumentation will have associated records and logbooks, including schedules and criteria for maintenance.

B-7 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Calibration is the process by which the correlation between instrument response and actual value of a measured parameter is determined. Field personnel will document acceptable calibration and calibration verification for each instrument unit and field test or analysis, linking this record

with affected sample measurements. Field equipment will be calibrated according to manufacturer's specifications.

The laboratory will calibrate analytical instruments in accordance with the USEPA's published methods, the Laboratory QA Plan, and associated SOPs.

B-8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Consumables such as bags, plastic sheeting, aluminum foil, gloves, tape, etc., are expected to be used during the sampling efforts. No special requirements are needed or expected for consumables or rental equipment/supplies. Supplies and consumables needed for sampling will be properly inspected and decontaminated prior to use by the field samplers. Consumables, such as standards, needed for field measurements will be inspected prior to use and only those that have not exceeded their shelf life will be used. The laboratory's SOPs incorporate procedures for critical supplies and consumables, including standard supply sources, acceptance criteria, for tracking and retrieving these materials.

B-9 NON-DIRECT MEASURMENTS

No data or information from non-measurement sources are expected to be used for this project.

B-10 DATA MANAGEMENT

Data for this project will be produced in two locations: onsite and at the contracted laboratory. Data collected onsite will be recorded on field data worksheets and/or in field logbooks. These field data worksheets and logbooks will become a part of the project file. Laboratory data will be submitted by the contracted laboratory within 30 calendar days of the laboratory's receipt of the samples. The Project Manager will be responsible for ensuring the analytical report meets the requirements specified in the order. All field records and the analytical report will be submitted to the Project Manager.

C-1 ASSESSMENTS AND RESPONSE ACTIONS

Due to the limited duration of the sampling events, no audits are anticipated.

C-2 REPORTS TO MANAGEMENT

Internal Reports

The Project QA Manager or Project Coordinator will provide status reports to the Project Manager. The reports will address the items outlined as follows:

- QA activities and quality of collected data,
- Equipment calibration and preventive maintenance activities,
- Results of data precision and accuracy calculations,
- Evaluation of data completeness, and
- QA problems and recommended and/or implemented corrective actions, and results of corrective action taken.

Analytical reports will be generated by the contracted laboratory within 30 calendar days after receipt of the samples who will then forward the analytical information to the Project Manager, or designee.

External Reports

Due to the short duration of this project, the only external reports to management will be a final project report, a field activities report and an analytical data report for all the samples. The final project report will be generated by the Project Manager, or designee, for inclusion in the project file at the completion of the project. This report will include a summary description of all project activities; a summary of all data, a discussion of any problems encountered and associated corrective actions, a discussion of the conclusions drawn from the results of this project and the rationale for those conclusions, and the results of the data quality assessment.

Draft and final reports will be delivered to Carrier per a mutually acceptable schedule between Carrier and EnSafe Inc. Carrier will be responsible for delivering the final reports to the NYSDEC.

D-1 DATA REVIEW, VERIFICATION, AND VALIDATION

Data will be accepted if they meet the following criteria:

- Field data sheets are complete
- Field data and laboratory data were validated
- Actual sample locations and collection procedures match the proposed sample locations and collection procedures identified in sections B-1 and B-2, respectively
- Sample handling procedures documented on chain-of-custody forms, the field activity report, and case narrative match the proposed sample handling procedures identified in sections B-2 and B-3 (e.g., water samples were acid preserved, holding times not exceeded)
- Field QC was conducted as planned and meets the acceptance criteria in section B-5

Data generated by project activities will be reviewed against the data quality objectives cited in Section A-7 and the QA/QC practices cited in Section B-5. Data will be separated into three categories: data meeting all data quality objectives, data meeting failing precision or recovery criteria, and data failing to meet accuracy criteria. Data meeting all data quality objectives, but with failures of QA/QC practices will be set aside until the impact of the failure on data quality is determined. Once determined, the data will be moved into either the first category or the last category.

Data falling in the first category is considered usable by the project. Data falling in the last category is considered not usable. Data falling in the second category will have all aspects assessed. If sufficient evidence is found supporting data quality for use in this project, the data will be moved to the first category, but will be flagged as estimated (with a J-flag) as per USEPA guidelines. The Project Manager will evaluate the cause of the data failures and make the decision whether to discard the data or re-sample.

Copies of data validation reports will be provided electronically to the NYSDEC.

D-2 VERIFICATION AND VALIDATION METHODS

The field data package will include all logbooks, field records, and measurements obtained onsite. The package will be verified by conducting:

- A review of the field data compiled on sampling logs for completeness. Failure in this area may result in the data being invalidated for the intent of the project.

- Verification that field equipment blanks and trip blanks were properly prepared, identified, and analyzed. Failure in this area may compromise the analytical data package and result in some data being considered qualitative or invalid.

- A check on field analyses for equipment calibration and condition. Failure in this area may result in the field measurements being invalid.

- A review of the chain-of-custody forms for proper completion, signatures of field personnel, and the laboratory sample custodian, and dates. Failure in this area may result in the data being invalid for the purpose of the project.

The Project Coordinator will review/validate the field data and any problems identified during this process will be reported to the Project Manager, who will include this information in the Management Report, as necessary. The contracted laboratory will review/validate the laboratory data according to their SOPs. Any problems identified during this process will be reported in the analytical data report.

D-3 RECONCILIATION WITH USER REQUIREMENTS

Once the data results are compiled, the QA Manager, or designee, will review the data to determine if they fall within the acceptance limits as defined in this QAPP. Completeness will also be evaluated to determine if the completeness goal for this project has been met. If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling may occur. The Project Manager will evaluate the cause of the failure (if possible) and make the decision whether to discard the data and re-sample.

REFERENCES

Code of Federal Regulations. Title 29, Part 1910.120.

Code of Federal Regulations. Title 40, Part 264 Appendix IX.

EnSafe Inc., *RCRA Facility Assessment Report, Carrier Thompson Road Facility, Syracuse New York.* 1997.

- *Release Assessment Report, Carrier Thompson Road Facility, Syracuse New York.* 2001.
- Carrier Thompson Road Facility RFI Work Plan. 2001.
- *Carrier Thompson Road Facility RFI Report.* 2001.
- *Carrier Thompson Road Facility RFI Report,* September 2001, Revised December 2001.
- *Carrier Thompson Road Facility RFI Report,* September 2001, Revised December 2001, Revised September 2002.
- Carrier Thompson Road Facility CMS Work Plan. 2002.
- Carrier Thompson Road Facility CMS Report. 2003.
- *Sanders Creek Sediment Sampling Report And Basis For Establishing PCB Cleanup Objective (Down-Gradient From Court Street To Confluence With Ley Creek; Up-Gradient From Carrier Facility Eastern Boundary To Sanders Creek Parkway),* December 2009.

NYSDEC. *Draft DER-10 Technical Guidance for Site Investigation and Remediation.* Division of Environmental Remediation; December 25, 2002.

- *Technical Guidance for Screening Contaminated Sediments, Division of Fish, Wildlife and Marine Resources*; January 25, 1999.

USEPA.. *EPA Requirements for Quality Assurance Project Plans.* EPA/240/B-01/003. March 2001.

— *Test Methods for* Evaluating *Solid Waste, Physical/Chemical Methods* (SW-846). Third edition Update III. Office of Solid Waste; December 1996.