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AECOM Environment

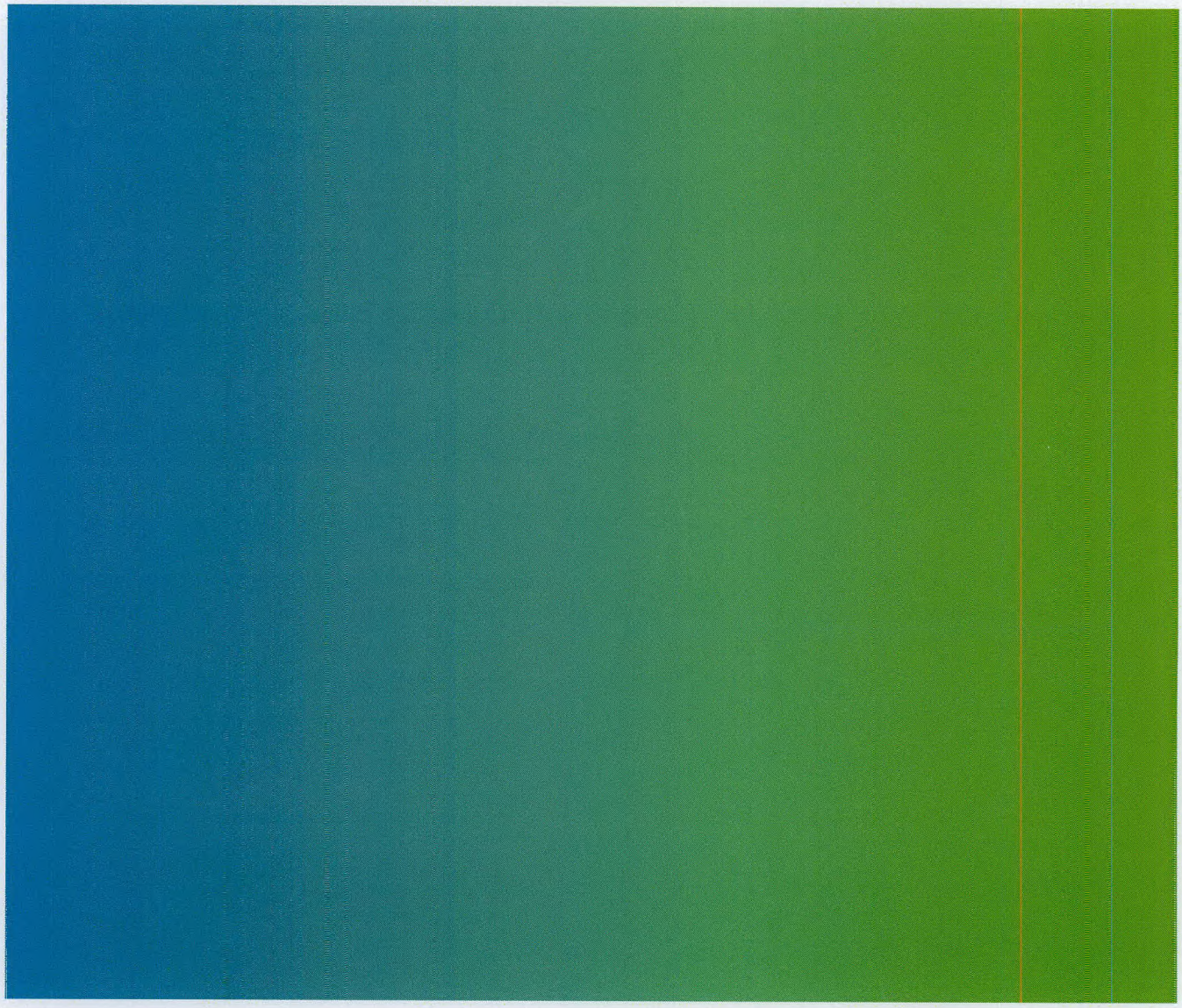
Prepared For:
United Technologies Corp.
Shared Remediation Services
Farmington, CT

Prepared by:
AECOM
Buffalo, NY
60314591
July 2015

SOUTHEAST DEBRIS/SOIL PILE
UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY
Sampling and Analysis Plan

Corrective Action Order - Index CO 7-20051118-4

NYSDEC Site Registry #734043



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Prepared for:

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List of Acronyms

ACM	Asbestos Containing Material
AOC	Area of Concern
bgs	Below Ground Surface
C&D	Construction and Demolition
CAMP	Community Air Monitoring Plan
CAO	Corrective Action Order
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
DER	Department of Environmental Remediation
DQO	Data Quality Objective
DUSR	Data Usability Summary Report
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSA	Hollow Stem Auger
kg	Kilogram
MDL	Method Detection Limit
mg	Milligram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NGVD	National Geodetic Vertical Datum
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PARCC	Precision, Accuracy, Representativeness, Comparability, and Completeness
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act, 1976
SAP	Sampling and Analysis Plan
SH&E	Safety, Health & Environmental
SIP	Self-Implementing Cleanup and Disposal Plan

SSO	Site Safety Officer
SVOC	Semivolatile Organic Compound
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
THA	Task Hazard Analysis
TSCA	Toxic Substances Control Act, 1976
UFPO	Underground Facilities Protection Organization
USEPA	United States Environmental Protection Agency
UTC	United Technologies Corporation
VOC	Volatile Organic Compound

Executive Summary

This Sampling and Analysis Plan addresses the 3.8-acre parcel of land identified as the Southeast Debris/Soil Pile, located at the United Technologies Corporation/Carrier facility on Thompson Road in Syracuse, New York (Site). The Southeast Debris/Soil Pile (Debris Pile) area was used to stockpile soils and construction and demolition debris generated from various onsite activities. The parcel was not sampled or investigated prior to the completion of an initial assessment of soil quality by EnSafe, Inc. (EnSafe) in 2013. Polychlorinated biphenyls (PCBs) were detected in most of the samples, at concentrations generally less than 1 milligram per kilogram (mg/kg), with a single maximum detection of 18.6 mg/kg; all PCB detections were less than 50 mg/kg.

The initial assessment data were reported to the New York State Department of Environmental Conservation (NYSDEC) as a new Area of Concern, as required by the Corrective Action Order – Index CO 7-20051118-4 for the United Technologies Corporation/Carrier Thompson Road facility.

AECOM conducted confirmation sampling of the Debris Pile in April 2014. A total of 65 PCB samples were collected from 20 soil boring locations utilizing a direct push technology rig. The soil sampling performed during the confirmation sampling event yielded nine soil samples containing PCB concentrations above 1 mg/kg, two soil samples above 10 mg/kg, and one sample with a total PCB concentration of 69.4 mg/kg (an exceedance of the Toxic Substances Control Act [TSCA]/NYSDEC Part 371.1 Hazardous Waste threshold of 50 mg/kg). As a result, a Self-Implementing Cleanup and Disposal Plan was submitted and approved by the United States Environmental Protection Agency, and remedial activities were performed between August 2014 and December 2014, including the removal of:

- 68,189.69 tons of non-hazardous soil and debris;
- 1,343.18 tons of TSCA/NYSDEC hazardous waste soil and debris; and
- 842.21 tons of potential asbestos containing material.

The Corrective Action Order requires the preparation of a Sampling and Analysis Plan capable of yielding representative samples sufficient to identify the migration of constituents of interest, if any, from the newly discovered Area of Concern. This Sampling and Analysis Plan was prepared to meet this requirement by addressing the following objectives:

- Assessing the presence or absence of residual constituents of interest in soil within the footprint of the former Debris Pile;
- Assessing the lateral and vertical extent of constituents of interest, if any, in soil outside the Debris Pile periphery;
- Evaluating the potential transport of these constituents in stormwater; and
- Assessing the presence or absence of dissolved phase constituents of interest in groundwater.

1.0 Introduction

1.1 Plan Objective

This Sampling and Analysis Plan (SAP) addresses a 3.8-acre parcel of land identified as the Southeast Debris/Soil Pile (Debris Pile) located at the United Technologies Corporation (UTC)/Carrier facility on Thompson Road, Syracuse, New York (hereinafter referred to as the Site and shown with the Debris Pile location on **Figure 1**). The Debris Pile area was used to stockpile soils and construction and demolition (C&D) debris generated from various activities onsite. The parcel had not been sampled or investigated prior to the completion of an assessment of soil quality performed for UTC by EnSafe Inc. (EnSafe) in 2013. When chemical analytes were detected in soil at the Debris Pile, this data was reported to the New York State Department of Environmental Conservation (NYSDEC) as a new Area of Concern (AOC), as required by the Corrective Action Order (CAO) – Index CO 7-20051118-4 for the UTC/Carrier Thompson Road facility. Subsequently, AECOM conducted confirmation sampling of the Debris Pile in April 2014. This data, combined with the 2013 initial assessment data, were used in the preparation of a Self-Implementing Cleanup and Disposal Plan (SIP) that was submitted to the United States Environmental Protection Agency (USEPA) in May 2014 and approved in June 2014. Remedial activities to remove the Debris Pile and sample the soil beneath it for polychlorinated biphenyls (PCBs) took place between July 2014 and December 2014.

The CAO requires the preparation of a Sampling and Analysis program capable of yielding representative samples sufficient to determine if there is migration of hazardous wastes and/or hazardous constituents from the newly discovered AOC to the environment. This SAP was prepared to meet this requirement.

1.2 Plan Organization

This SAP was developed to meet the site investigation requirements specified in guidance prepared by the NYSDEC Department of Environmental Remediation (Document DER-10). The SAP is organized into the following sections:

- Section 1.0 contains an introduction, objective, and report organization details;
- Section 2.0 contains a Site Description and Site history;
- Section 3.0 includes the SAP Scope of Work and description of field activities to be completed;
- Section 4.0 references the summary of quality assurance/quality control (QA/QC) protocols to be followed during the project; and
- Section 5.0 describes the reporting requirements and schedule.

2.0 Site Background

2.1 Site Description

Historic information provided by Site personnel indicated that the 3.8-acre Debris Pile area was used to stockpile soils and C&D debris generated from various onsite activities from the late 1980s until the early 2000s. The Debris Pile was comprised largely of soil with moderate amounts of C&D debris stockpiled mostly within the northwest corner of the Debris Pile.

2.2 Previous Site Assessments and Investigations

2.2.1 Initial AOC Assessment

At UTC's request, EnSafe personnel visited the Carrier facility in Syracuse, New York, on July 17, 2013, to inspect the Debris Pile and interview Carrier personnel regarding its past uses. Prior to this Site visit, sampling and analysis of the Debris Pile materials had not been performed.

The Debris Pile was observed to be approximately 250 feet wide x 580 feet long, with varying heights ranging from a maximum of 6 to 8 feet above the surrounding grade, but predominantly less than 4 feet high. The Debris Pile is surrounded by an 8-foot chain-link fence with a single access gate on the west side. EnSafe observed pieces of concrete slab and wood block flooring on the surface of the Debris Pile, some of which had a petroleum-like odor. The Debris Pile consisted primarily of soil. Carrier personnel indicated that some of these materials may have originated in areas of former manufacturing operations. During the assessment, 102 soil samples and 16 C&D rubble samples were analyzed for volatile organic compounds (VOCs) using USEPA Method 8260C; semivolatile organic compounds (SVOCs) by USEPA Method 8270D; PCBs by USEPA Method 8082, pesticides by USEPA Method 8081B; herbicides by USEPA Method 8151; and Resource Conservation and Recovery Act (RCRA) metals (total) by USEPA Method 6010B.

The results of the soil sample analyses are listed below:

- While 11 out of 118 samples collected exhibited concentrations of metals exceeding the Toxicity Characteristic Leaching Procedure (TCLP) "Rule of 20" for lead and chromium, none exceeded the TCLP regulatory limits when follow-up analyses were performed using the TCLP extraction method.
- PCBs were detected in the majority of the samples. However, most concentrations were less than 1 milligram per kilogram (mg/kg). Of the 13 detections out of 118 samples above 1 mg/kg, 11 were less than 10 mg/kg with only a single detection at 18.6 mg/kg.
- The materials in the Debris Pile did not appear to be toxicity characteristic hazardous wastes based on the data collected. As the maximum concentration of PCBs detected in any sample from the Debris Pile was 18.6 mg/kg, there was no evidence that these materials came from an onsite source greater than 50 mg/kg.

2.2.2 Confirmation Sampling Event

A confirmation sampling event was conducted by AECOM in April 2014 based on the results of the EnSafe initial assessment. The confirmation sampling event results indicated that nine of the 65 soil samples collected contained PCB concentrations above 1 mg/kg, and two soil samples were above

10 mg/kg. Of the 65 samples, one sample exceeded the Toxic Substances Control Act (TSCA)/NYSDEC Part 371.1 hazardous waste threshold of 50 mg/kg, at a value of 69.4 mg/kg.

2.3 Remedial Action

2.3.1 Remedial Activities

Site mobilization for the Debris Pile remedial activities began in late July 2014. The existing erosion and sediment controls that surrounded the Debris Pile prior to the start of work were left in place and maintained during the project. Catch basins located downgradient (to the north) of the Debris Pile had previously been covered with a geotextile layer and surrounded by hay bales, which were left in place during and following the conclusion of remedial activities.

Non-hazardous soils containing PCBs less than 50 mg/kg were loaded onto trucks and transported to the Ontario County Landfill located in Stanley, New York. A total of 68,189.69 tons of non-hazardous soil and debris (including imported truck access road material) was removed from the Debris Pile between August 2014 and December 2014.

Soils removed from the area surrounding the TSCA soil sample location were disposed as TSCA waste at the Waste Management Model City Landfill in Model City, New York in September 2014. In addition, any personal protective equipment worn during the removal of material from Area C was disposed (with the soil and debris) as TSCA material. A total of 1,343.18 tons of TSCA soil and debris was removed from the Debris Pile.

In September 2014, potential asbestos containing material (ACM) was segregated by Environmental Contracting & Construction Services, LLC and loaded onto trucks for disposal at the Ontario County Landfill. A total of 842.21 tons of potential ACM was removed from the Debris Pile.

2.3.2 Verification Sampling Results and Demobilization

In accordance with USEPA requirements, one surface sample was collected within each of 264 25-foot by 25-foot sections (grid sections) at the base of the former Debris Pile. A surface sample was collected from 0 to 2 inches below ground surface (bgs) at each of these locations. The soil samples were analyzed using USEPA Method 3550B/8082, per 40 CFR 761.272. **Figure 2** presents the verification sample locations and sample IDs.

Sample results ranged from below method detection limits to 0.92 mg/kg total PCBs. By assigning samples with results below detection limits a value of one-half the average method detection limit (MDL), or 0.0075 mg/kg, the 90th percentile concentration for the upper confidence limit for all grid section results is 0.351 mg/kg, with an average concentration of 0.127 mg/kg. It is noted that out of 264 total sample results, the number of samples with concentrations between 0.5 mg/kg and 1.0 mg/kg was limited to 15 samples.

Following receipt of all of the verification sample results, winterization activities took place in mid-December 2014. Winterization included import of material to fill low areas and grading of the ground surface to prevent ponding of precipitation, installation of erosion control matting across the entire footprint of the former Debris Pile, and installation of hay bales around the perimeter as an added measure of erosion control along the silt fence at the southern edge of the former Debris Pile. The current elevation grades for the base of the former Debris Pile are shown on **Figure 2**.

3.0 Scope of Work

The objective of this SAP is to specify a Sampling and Analysis program capable of yielding representative samples sufficient to determine if there is migration of hazardous wastes and/or hazardous constituents from the Debris Pile to the environment. The specific objectives of this SAP include:

- Assessing the vertical extent of constituents of interest in soil within the footprint of the former Debris Pile;
- Assessing the lateral and vertical extent of constituents of interest in soil, if any, outside the former Debris Pile periphery;
- Evaluating the potential transport of these constituents in stormwater; and
- Assessing whether dissolved constituents have impacted groundwater.

The subtasks below describe the procedures to be completed in support of these objectives. Additional information regarding these procedures are included in a summary table (**Table 1**), in the sampling and analytical protocols described in Section 4, and in detailed descriptions of the analytic protocols listed in the Quality Assurance Project Plan (QAPP) for the work, which has been prepared under separate cover.

3.1 General Field Activities

General field activities include site meetings, mobilization, health and safety planning, soil boring and monitoring well installation, sampling and analytical testing, decontamination and handling of investigation wastes, and surveying. Subcontractors will be used for drilling, laboratory analyses, and surveying.

The sampling methods and equipment selected will limit both the need for decontamination and the volume of waste material to be generated. Decontamination procedures specific to each of the field activities are described in a later section of this SAP. Personal protective equipment (i.e., latex gloves) and disposable sampling equipment (i.e., polyethylene tubing) will be placed in plastic garbage bags for disposal as a solid waste. Soil cuttings and monitoring well purge water will be drummed and stored on-site pending analyses for appropriate disposal.

3.1.1 Mobilization

Following approval of the SAP by NYSDEC, the Underground Facilities Protection Organization (UFPO) will be contacted at 1-800-962-7962 to clear exploration locations. Utility clearance requires three working days by UFPO.

3.1.2 Health & Safety

Personnel performing work at the job site will be qualified for Hazardous Waste Operations and Emergency Response (HAZWOPER) duty in accordance with 29 CFR 1910.120, and will be provided with information on hazards specific to the project as conveyed in Task Hazard Analyses (THAs), and the site-specific Health and Safety Plan (HASP). Personnel will meet the medical monitoring and training requirements specified in AECOM's North America Safety, Health and

Environmental (SH&E) Standard Operating Procedures, and will complete UTC Contractor Environment, Health & Safety Training.

It is anticipated that the work to be completed at the former Debris Pile will be performed with Level D personal protection equipment. Field personnel will be instructed to maintain Level C equipment available should it be needed. Should health and safety monitoring during field activities indicate a threat to field personnel or warrant an upgrade beyond Level C protection, work will stop and Site conditions will be re-evaluated.

Prior to the commencement of sampling and analysis activities, a tailgate meeting will be conducted by the Site Safety Officer (SSO) to review the site-specific health and safety requirements and applicable THAs. Attendance at the daily tailgate meeting is mandatory for all personnel at the Site covered in this plan and will be documented on the attendance form. All safety training documentation is to be maintained in the project file by the SSO. All field personnel have the right and duty to stop work when, in their opinion, conditions are unsafe and to assist in correcting these conditions. Additional health and safety details will be provided in the site-specific HASP.

3.2 Debris Pile Area Sampling and Analysis Field Investigation

The investigation activities described in this SAP include field procedures compliant with NYSDEC's DER-10 "Technical Guidance for Site Investigation and Remediation", dated May 2010. Field activities will be documented in a dedicated, bound log book and on standard field data forms specific to the investigation phase.

3.2.1 Shallow Soil and Sediment Sampling

During the sampling activities, surface soils and sediment will be sampled from up to 24 locations within and peripheral to the former Debris Pile as described below and shown on **Figure 3**. Actual locations may be adjusted slightly based on the locations of utilities.

- Samples will be collected during the completion of five soil borings (proposed soil boring locations SB-01 through SB-05) for installation of monitoring wells adjacent to the former Debris Pile (four locations) and within the former TSCA area (five locations, see Section 3.2.2 below). Soil samples will be collected at monitoring well locations from 0 to 2 inches bgs (0 to 6 inches bgs for VOCs), the 2 to 12 inch bgs interval (6 to 12 inches bgs for VOCs), and the 12 to 24 inch bgs interval at each of these locations and submitted for laboratory analysis of VOCs, SVOCs, RCRA 8 metals, PCBs (except SB-05), pesticides, and herbicides using USEPA SW-846 methodology.
- Five shallow soil borings (SB-06 through SB-10) will be completed within the footprint of the former Debris Pile using a stainless steel hand auger. Samples will be collected from 0 to 2 inches bgs (0 to 6 inches bgs for VOCs), the 2 to 12 inch bgs interval (6 to 12 inches bgs for VOCs), and the 12 to 24 inch bgs interval at each of these locations and submitted for laboratory analysis of VOCs, SVOCs, RCRA 8 metals, pesticides, and herbicides using USEPA SW-846 methodology.
- Additionally, nine shallow soil borings (SB-11 through SB-19) will be completed adjacent to the footprint of the former Debris Pile using a stainless steel hand auger. These samples will be collected from 0 to 2 inches bgs (0 to 6 inches bgs for VOCs), the 2 to 12 inch bgs interval (6 to 12 inches bgs for VOCs), and the 12 to 24 inch bgs interval at each of these locations and submitted for laboratory analysis of VOCs, SVOCs, RCRA 8 metals, PCBs, pesticides, and herbicides using USEPA SW-846 methodology. The samples collected from the three

easternmost soil borings (SB-17 through SB-19 located adjacent to Kinne Street) will be held pending the analysis of the other samples collected at the Debris Pile. If sample results from the other samples collected from across the former Debris Pile area are below detection limits, the samples collected from the three locations adjacent to Kinne Street will not be analyzed.

- Sediment samples will be collected from five locations (SE-01 through SE-05). At each sediment sampling location, a stainless steel or disposable plastic scoop will be used to collect an adequate volume of sediment into a stainless steel bowl for packaging in appropriate sample containers. One sample will be collected from each of four stormwater catch basins located along the former Debris Pile's northern perimeter bordering the UTC parking lot. One sediment sample will be collected from the Kinne Street ditch, a surface drainage swale, which daylights on the north side of the entrance to UTC's facility from Kinne Street, immediately west of Winchester Road. The sediment samples will be submitted for laboratory analysis of VOCs, SVOCs, RCRA 8 metals, PCBs, pesticides, and herbicides using USEPA SW-846 methodology.

Table 1 contains a summary of the sampling rationale and analytical quantities and methods for all media, as described above.

Soil and sediment samples collected as described above will be scanned for total VOCs with a calibrated Photovac 2020 photoionization detector (PID) equipped with a 10.6 eV lamp (or equivalent), and characterized for impacts by visual and/or olfactory observations. Field observations will be recorded in a dedicated, bound log book. Soil samples will be biased towards indications of contaminant impact or waste material based on visual or olfactory evidence, and/or PID readings. Based on the results of the verification sampling results (all sample results were less than 1 mg/kg), samples from within the former Debris Pile footprint will be analyzed for all listed parameters except PCBs. Samples for VOCs will be collected using TerraCore samplers. A quantity of sample adequate to fill containers for SVOCs, PCBs, RCRA 8 metals, pesticides, and herbicides will be placed in a stainless steel mixing bowl, or equivalent, and composited prior to filling the containers. Samples will be transferred to laboratory supplied, pre-cleaned sample containers. Stainless steel spatulas or other sampling tools will be decontaminated as described in Section 3.2.3 of this SAP.

3.2.2 Test Boring, Monitoring Well Installation, Soil and Groundwater Sampling

A total of four soil borings will be completed around the periphery of the former Debris Pile, which will be converted to permanent monitoring wells (MW-01 through MW-04) as shown on **Figure 3**. Additionally, one soil boring (SB-05) will be installed in the area that formerly contained TSCA soils within the Debris Pile footprint, and will be converted to a fifth permanent monitoring well (MW-05). These locations may be adjusted based on the locations of utilities.

Five test borings for monitoring well installations will be advanced into the overburden soils using a track or truck mounted drill rig using $4^{1}/_{4}$-inch inside diameter hollow stem augers (HSAs). Test boring/monitoring well locations will be extended to a depth sufficient to yield a representative groundwater sample or bedrock if groundwater is not encountered in overburden soils. Soil samples will be obtained for observation and lithologic characterization by driving a $1\ ^{3}/_{8}$-inch inside diameter by 24-inch long split spoon sampler 24-inches ahead of the lead cutting shoe of the HSA, in general accordance with ASTM D1586. Drilling fluids will not be used while advancing the HSA so overburden groundwater can be identified if encountered. Soil spoils generated from the test borings will be contained in drums for characterization prior to disposal. The test borings will be observed by

a field engineer/geologist, and an AECOM standard boring log will be created for each boring/monitoring well installed. Real-time air monitoring will be conducted while test borings are being completed using a PID and MINIRAM aerosol monitor. Soil samples will be collected at two-foot intervals to the bottom of the boring for classification and screening with the PID equipment.

Groundwater monitoring wells will be constructed with 10-foot long, 2-inch inner diameter flush coupled polyvinyl chloride (PVC) screen with a solid riser extending to approximately 2 feet above ground surface. The screened interval of each well will intercept the water table, extending approximately 7-8 feet below and 2-3 feet above the water table. A sand filter will be placed in the boring around the annulus space of the well screen such that the sand extends a minimum of 1foot above the top of the screen. An approximately 2-foot thick layer of bentonite will be placed above the sand filter to provide a seal from the overlying overburden conditions. Depending on field conditions, properly hydrated bentonite chips or a mixture of cement/bentonite grout will extend from the bentonite seal to approximately 1 foot bgs. The monitoring well will be completed with a lockable flush-mount well cover over the riser. Concrete will be placed around the steel casing at the top of each boring and sloped away from the casing.

The monitoring wells will be developed by over-pumping to remove the fines and develop the filter pack. Water level measurements will be collected and used with the monitoring well top of casing information to interpret groundwater flow direction. One groundwater sample will be collected from each well using the low-flow purge technique and a peristaltic pump; stabilization of groundwater geochemistry will be documented on standard AECOM purge logs. As indicated in **Table 1**, groundwater samples will be analyzed for VOCs, SVOCs, RCRA 8 metals, PCBs, pesticides, and herbicides using USEPA SW-846 methodology. Following receipt of all analytical data, in the event that a monitoring well does not contain detectable concentrations of any contaminants, UTC/Carrier may elect to abandon the well at a future date.

3.2.3 Community Air Monitoring

VOCs and dust particulates will be monitored upwind and at the downwind perimeter of the active work area.

If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 ppm above background for the 15-minute average, work activities will be temporarily suspended and monitoring continued. If the total organic vapor levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided the total organic vapor levels 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure (whichever is less) is below 5 ppm over background. If the total organic vapor level is above 10 ppm at the perimeter of the work area, activities will be shut down and appropriate actions taken to mitigate the organic vapor source.

Particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. Each particulate monitor will be calibrated daily with a filtered air sample.

If particulates levels at the downwind station exceed particulate levels at the upwind station by more than 100 micrograms per cubic meter ($\mu g/m^3$), work activities will be halted and appropriate dust suppression measures will be employed. All readings will be recorded and be made available for the NYSDEC and the NYSDOH personnel to review if requested.

The NYSDOH Generic CAMP-specified action level of 0.10 milligrams per cubic meter (mg/m^3) above background for particulate matter less than 10 micrometers in size (PM-10) will be used to determine whether modifications to given processes are required. If the downwind measurement of particulates less than 10 micrometers in size (PM-10) is greater than 0.10 mg/m^3 above the upwind background level, or if dust is observed leaving the project area, dust suppression techniques (i.e., misting surfaces with water, or covering open soil piles) will be implemented to reduce the generation of fugitive dust. Furthermore, if the action level of 0.15 mg/m^3 (above background) is exceeded, work activities will be ceased and site work activities will be re-evaluated.

3.2.4 Decontamination Procedures

To avoid cross contamination, sampling equipment such as direct push samplers, stainless steel sampling devices, and mixing bowls will be decontaminated using the following procedures:

- Alconox (or equivalent) and potable water wash;
- Potable water rinse; and
- Distilled/deionized water rinse.

Augers will be steam cleaned on polyethylene sheeting. Solvents will not be used in the field decontamination of such equipment.

3.3 Environmental Analytical Testing Program

Table 2 contains a summary of the types and sizes of sample bottles, as well as the minimum sample volume required, preservation methods, and holding times for each analyte. The number and types of environmental samples to be collected is summarized in **Table 3**. The samples collected as part of this SAP will be submitted for analytical testing according to USEPA SW-846 methods with an equivalent Category B deliverable package and data validation. To the extent allowed by existing physical conditions at the Site, sample collection efforts will adhere to the specific methods presented in this SAP. If alternative sampling locations or procedures are implemented in response to Site-specific constraints, each will be selected on the basis of meeting data objectives. Further information regarding analytic protocols and quality criteria can be found in the QAPP and briefly summarized in Section 4.0.

3.4 Survey

Each soil boring location and each monitoring well will be surveyed upon the completion of the fieldwork. A licensed land surveyor will conduct the survey. Vertical measurements will include a ground surface elevation and top of casing for monitoring wells. Vertical measurements will be made relative to the National Geodetic Vertical Datum (NGVD). Monitoring point measurements and top of casing measurements will be accurate to within 0.01 foot. Horizontal measurements and ground surface elevations will be accurate to within 0.1 foot. The survey will include pertinent Site features, as applicable.

4.0 Quality Assurance/Quality Control

A QAPP has been prepared under separate cover in support of the SAP to ensure the accuracy and precision of data collection during the Site characterization and data interpretation activities. The QAPP specifies the Data Quality Objectives (DQOs) for the project, and identifies the principal organizations involved in verifying achievement of data collection goals. Data collected and analyzed in conformance with the DQO process described in the QAPP will be used in assessing the overall level of uncertainty associated with decisions related to this Site. The QAPP has been prepared in accordance with USEPA's Requirements for Quality Assurance Project Plans for Environmental Data Operations; the USEPA Region II Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Manual, and NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation (May 2010).

4.1 Scope of the QAPP

The QAPP was prepared to provide QA guidelines to be implemented during the SAP activities. This document may be modified for subsequent phases of investigative work, as necessary. The QAPP provides:

- A means to communicate to the persons executing the various activities exactly what is to be done, by whom, and when;
- A culmination to the planning process that ensures that the program includes provisions for obtaining quality data (e.g., suitable methods of field operations);
- A historical record that documents the investigation in terms of the methods used, calibration standards and frequencies planned, and auditing planned;
- A document that can be used by the Project Manager and QA Officer to assess if the activities planned are being implemented and their importance for accomplishing the goal of quality data;
- A plan to document and track project data and results; and
- Detailed descriptions of the data documentation materials and procedures, project files, and tabular and graphical reports.

The QAPP is primarily concerned with the quality assurance and quality control aspects of the procedures involved in the collection, preservation, packaging, and transportation of samples, field testing, record keeping, data management, chain-of-custody procedures, laboratory analyses, and other necessary matters to assure that the investigation activities, once completed, will yield data whose integrity can be verified.

4.2 Organization and Responsibility

The principal organizations involved in verifying achievement of data collection goals for the project include the NYSDEC, UTC, AECOM, the drilling subcontractor(s), the independent environmental laboratory, and the data validator.

Roles, responsibilities, and required qualifications of these organizations are discussed in the QAPP.

4.3 Objectives for Measurement Data

DQOs for measurement data in terms of sensitivity and the PARCC parameters (precision, accuracy, representativeness, comparability, and completeness) are established so that the data collected are sufficient and of adequate quality for their intended use. Data collected and analyzed in conformance with the DQO process described in the QAPP will be used in assessing the uncertainty associated with decisions related to this Site. The overall objectives and criteria for assuring quality for this effort are discussed in Section 4.2 of the QAPP.

4.4 Data Usability Evaluation

Data evaluation/validation will be performed by a qualified data validator using the most current methods and quality control criteria from the USEPA's Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review, and CLP National Functional Guidelines for Inorganic Data Review. The data review guidance will be used only to the extent that it is applicable to the SW-846 methods; SW-846 methodologies will be followed primarily and given preference over CLP when differences occur. In addition, results of blanks, surrogate spikes, matrix spike/matrix spike duplicates (MS/MSDs), and laboratory control samples will be reviewed/evaluated by the data validator. All sample analytical data for each sample matrix shall be evaluated. The data validation expert will also evaluate the overall completeness of the data package. Completeness checks will be administered on all data to determine whether deliverables specified in the QAPP are present. The reviewer will determine whether all required items are present and request copies of missing deliverables.

5.0 Reporting & Schedule

Upon receipt of the laboratory analytic reports and Electronic Data Deliverables, the data will be uploaded into an EQuIS database. The database and laboratory hardcopy reports will be forwarded to the data validator who will insert the appropriate qualifiers into the data tables and prepare a Data Usability Summary Report (DUSR). The validated data will then be entered into the EQuIS database. Upon receipt of these deliverables, AECOM will prepare the Sampling and Analysis Plan Report according to the schedule in the CAO.

5.1 Reporting

The Sampling and Analysis Report will include the following information and documentation, consistent with the NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation (May 2010).

- Introduction, Site history, summary, and description of the Debris Pile.
- A description of the field procedures and methods used during sampling and analysis.
- The data obtained during sampling and analysis that may include field measurements and geochemical data.
- Comparative criteria that may be used to determine cleanup levels during analysis of analytical data, such as NYSDEC Soil Cleanup Objectives.
- A discussion of contaminant fate and transport.
- Conclusions regarding the extent and character of constituents of interest in the media being investigated.
- Conclusions of qualitative human health and environmental risk assessments including recommendations for future assessments or remedial actions if applicable.
- Supporting documents for the sampling analysis report that may include boring logs, monitoring well construction diagrams, laboratory analytical reports, etc.

The DUSR and tabulated, validated data will be appended to the Sampling and Analysis Report.

5.2 Schedule

After submittal of this SAP, UTC and AECOM will either meet with NYSDEC and submit a revised SAP within 30 days of the meeting; or if no meeting is deemed to be necessary, will submit a revised SAP within 45 days of receipt of comments from NYSDEC. Within 30 days of receipt of approval of this SAP by NYSDEC, AECOM will begin implementation of the SAP activities. AECOM will prepare a SAP Report within 30 days of receipt of validated laboratory data generated by the SAP activities.

Tables

TABLE 1

Sampling and Analysis Plan Field and Laboratory Sample Summary
Southeast Debris/Soil Pile

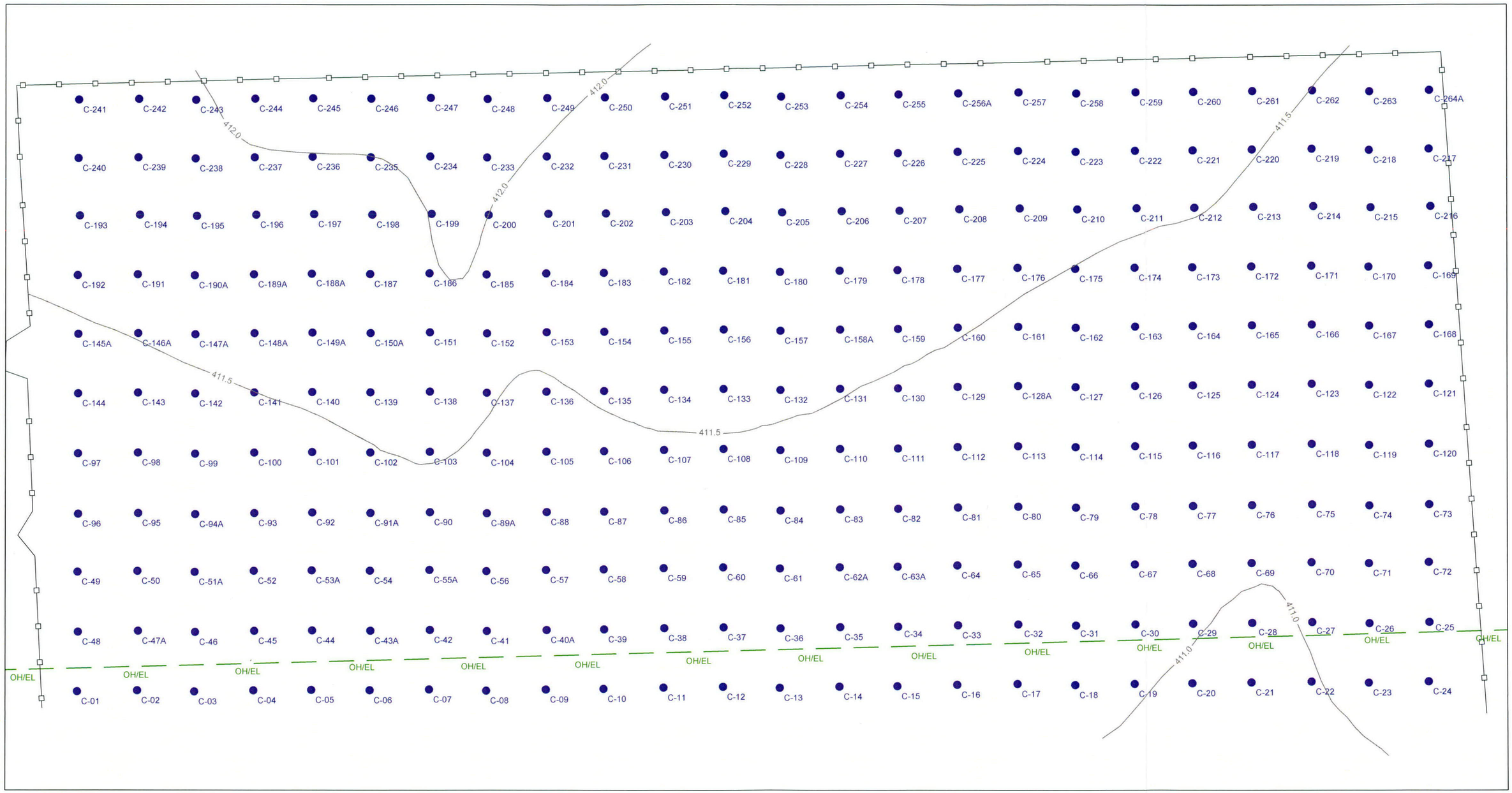
FIELD TASK	RATIONALE	DEPTHS	LOCATIONS	QUAN.	MEDIA	ANALYTICAL
Sampling of Soil Borings	Assess potential leaching of constituents from former Debris Pile to soils adjacent to its former footprint.	0 - 2 inches (0 - 6 inches VOCs only)	Collect soil samples from 4 locations using an auger rig while installing monitoring wells. Collect soil samples from 9 additional locations using a hand auger. Hold analysis of 3 easternmost soil borings pending receipt of results from other soil samples.	13	Soil	VOCs +10 TICs; SVOCs +20 TICs; PCBs; RCRA 8 Metals; Pest; Herb
		2 - 12 inches (6 - 12 inches VOCs only)		13	Soil	VOCs +10 TICs; SVOCs +20 TICs; PCBs; RCRA 8 Metals; Pest; Herb
		12 - 24 inches		13	Soil	VOCs +10 TICs; SVOCs +20 TICs; PCBs; RCRA 8 Metals; Pest; Herb
	Assess potential leaching of constituents from former Debris Pile to soils within former TSCA area.	0 - 2 inches (0 - 6 inches VOCs only)	Collect soil samples from 1 location using an auger rig while installing a monitoring well.	1	Soil	VOCs +10 TICs; SVOCs +20 TICs; RCRA 8 Metals; Pest; Herb
		2 - 12 inches (6 - 12 inches VOCs only)		1	Soil	VOCs +10 TICs; SVOCs +20 TICs; RCRA 8 Metals; Pest; Herb
		12 - 24 inches		1	Soil	VOCs +10 TICs; SVOCs +20 TICs; RCRA 8 Metals; Pest; Herb
	Assess potential leaching of constituents from former Debris Pile to soils underlying its former footprint.	0 - 2 inches (0 - 6 inches VOCs only)	Collect soil samples from 5 locations within the former footprint of Debris Pile using a hand auger.	5	Soil	VOCs +10 TICs; SVOCs +20 TICs; RCRA 8 Metals; Pest; Herb
		2 - 12 inches (6 - 12 inches VOCs only)		5	Soil	VOCs +10 TICs; SVOCs +20 TICs; RCRA 8 Metals; Pest; Herb
		12 - 24 inches		5	Soil	VOCs +10 TICs; SVOCs +20 TICs; RCRA 8 Metals; Pest; Herb
Sediment Sampling	Assess potential releases of constituents to storm water catch basins and drainage swale.	Sediment in basin or swale as available	Four catch basins adjacent to Debris Pile; Kinne Street ditch.	5	Sediment	VOCs +10 TICs; SVOCs +20 TICs; PCBs; RCRA 8 Metals; Pest; Herb
Groundwater Sampling	Assess potential impacts to groundwater from constituents present in the former Debris Pile.	Assumed completion depth at 15 feet bgs	Four locations adjacent to Debris Pile; one location in former TSCA area of Debris Pile.	5	Groundwater	VOCs +10 TICs; SVOCs +20 TICs; PCBs; RCRA 8 Metals; Pest; Herb

TSCA: Toxic Substances Control Act of 1976
VOCs: Volatile Organic Compounds
SVOCs: Semi-Volatile Organic Compounds
PCBs: Polychlorinated Biphenyls
RCRA 8: Resource Conservation and Recovery Act Metals Analyte List (8 Metals)
Pest: Pesticides
Herb: Herbicides
TICs: Tentatively Identified Compounds
bgs: below ground surface

Table 2
Sample Bottle, Volume, Preservation, and Holding Time Summary
Southeast Debris/Soil Pile SAP

MATRIX/ANALYSIS	Sample Prep Method [1]	Analytical Method [(2)]	Sample Bottles (3)				Minimum Vol Rqd	Preservation (4)	Holding Time (4, 5)		Comment
			Mat'l	Size	Qty	Source			Extraction	Analysis	
Aqueous Samples											
Volatile Organics	SW 846 5030B	SW 846 8260C	G	40 mL	2 or 3	Lab	40 mL	HCl to pH ≤ 2	NA	14 days	7 days if not preserved.
Semivolatile Organics	SW 846 3510C/3520C/3535A	SW 846 8270D	G	1 L	2	Lab	1 L	None	7 days	40 days	
Pesticides/Herbicides	SW 846 3510C/3520C/3535A	SW 846 8081B/SW 846 8151A	G	1 L	1	Lab	1 L	None	7 days	40 days	
PCBs	SW 846 3510C/3520C/3535A	SW 846 8082A	G	1 L	1	Lab	1 L	None	7 days	40 days	
RCRA 8 Metals (except Mercury)	SW 846 3005A/3010A/3020A	SW 846 6010C	P	250 mL	1	Lab	200 mL	HNO_3 to pH≤ 2	NA	180 days	180 days for RCRA 8 Metals except mercury.
Mercury	SW 846 7470A	SW 846 7470A	"	"	"	"	"	"	NA	28 days	28 days for mercury.
Non-Aqueous Samples											
Volatile Organics	SW 846 5035A	SW 846 8260C	TerraCore	5 or 25 g	3 or 1	Vendor [7]	5 g	None	NA	48 hours [8]	
Semivolatile Organics	SW 846 3540C/3541/3545A	SW 846 8270D	G	8 oz [(6)]	1	Lab	30 g	None	14 days	40 days	
Pesticides/Herbicides	SW 846 3540C/3541/3545A	SW 846 8081B/SW 846 8151A	G	"	"	Lab	30 g	None	14 days	40 days	
PCBs	SW 846 3540C/3541/3545A	SW 846 8082A	G	"	"	Lab	30 g	None	14 days	40 days	
RCRA 8 Metals (except Mercury)	SW 846 3050B/3051A/3052	SW 846 6010C	G	"	"	Lab	10 g	None	NA	180 days	180 days for RCRA 8 Metals except mercury.
Mercury	SW 846 7471B	SW 846 7471B	"	"	"	"	2 g	"	NA	28 days	28 days for mercury.

(1) Laboratory may propose alternate extraction/preparation methods, subject to AECOM approval.
(2) More recent versions of SW-846 methods may be used subject to AECOM approval.
(3) Bottles typical. TerraCore samplers for VOCs in soil will be provided by laboratory or AECOM on a case-by-case basis.
(4) All samples for chemical analysis should be held at 4 degrees C in addition to any chemical preservation required.
(5) Holding time calculated from day of collection, unless noted as being from time of extraction. Laboratory holding times (ASP 2005, Exhibit I) are two days shorter to allow for field handling and shipping.
(6) A single 8-oz sample is sufficient for SVOCs, pesticides, PCBs, and metals.
(7) TerraCore samplers are typically purchased from an outside supplier by AECOM but may also be requested (for a fee) from the analytical laboratory.
(8) TerraCore samplers must be prepared/preserved in the laboratory within 48 hours of collection. Soil samples in glass bottles and preserved TerraCores have a 14 day (total) holding time.
G = Glass
P = Plastic
SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. USEPA SW-846. Complete through Update IV, March 2009.



LEGEND

- 412.0 — CONTOUR INTERVAL
- C-150 — VERIFICATION SAMPLE LOCATION
- FENCE
- OH/EL — UTILITY LINE

N

Approximate Scale (ft)

0 20 40

PROJ. NO:	60328507
DATE:	6-19-2015
DRAWN:	CTN
APPROVED:	-

AECOM

NOTES:
1) DATUM BASE ON CARRIER CAMPUS DATUM
2) ZERO BASE PLANE ELEVATION=EL. 42.0

SHEET TITLE: SELF-IMPLEMENTING CLEANUP PLAN VERIFICATION SAMPLE LOCATIONS (OCTOBER-DECEMBER 2014)

PROJECT:
SOUTHEAST DEBRIS/SOIL PILE
UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY

DRAWING REFERENCE:
1) Drawing based on FIGURE 2, "SE DEBRIS PILE TOPOGRAPHIC SURVEY", by ENSAFE., dated JANUARY 2014, including all reference therein.

FIGURE 2

Table 3
Sampling and Analysis Plan Laboratory Analyses
Southeast Debris/Soil Pile

Reporting Limits and QA/QC Sample Quantity Summary

MATRIX/ANALYSIS	Analytical Method	Laboratory	Reporting Limit -Typical (units as specified)	Field Sample Quantity	Matrix Spike (MS) or LCS	MS Duplicate or Matrix Duplicate	Field Duplicate	Equipment Blank [2]	Trip Blank	Total Analyses
Aqueous Samples										
Volatile organics	SW 846 8260C	ACCUTEST	0.5 - 1.0 µg/L (typical)	5	1	1	1	1	1	10
Semivolatile organics	SW 846 8270D	ACCUTEST	10 - 20 µg/L (typical)	5	1	1	1	1	0	9
Pesticides/Herbicides	SW 846 8081B/SW 846 8151A	ACCUTEST	0.05 - 0.5 µg/L (typical)	5	1	1	1	1	0	9
PCBs	SW 846 8082A	ACCUTEST	33 µg/L	5	1	1	1	1	0	9
RCRA 8 Metals	SW 846 6010C/7470A	ACCUTEST	Analyte-specific	5	1	1	1	1	0	9
Soil/Sediment Samples										
Volatile organics	SW 846 8260C	ACCUTEST	5 µg/kg (typical) [1]	62 [4]	4	4	4	4	0	78 [3, 4]
Semivolatile organics	SW 846 8270D	ACCUTEST	330 µg/kg (typical) [1]	62 [4]	4	4	4	4	0	78 [3, 4]
Pesticides/Herbicides	SW 846 8081B/SW 846 8151A	ACCUTEST	1.7-3.3 µg/kg (typical) [1]	62 [4]	4	4	4	4	0	78 [3, 4]
PCBs	SW 846 8082A	ACCUTEST	57 - 70 µg/kg [1]	44 [4]	3	3	3	3	0	56 [3, 4]
RCRA 8 Metals	SW 846 6010C/7471B	ACCUTEST	Analyte-specific	62 [4]	4	4	4	4	0	78 [3, 4]

RCRA 8 = Resource Conservation and Recovery Act Metals Analyte List (8 Metals)
PCBs = polychlorinated biphenyls
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
LCS = Laboratory Control Sample

Notes

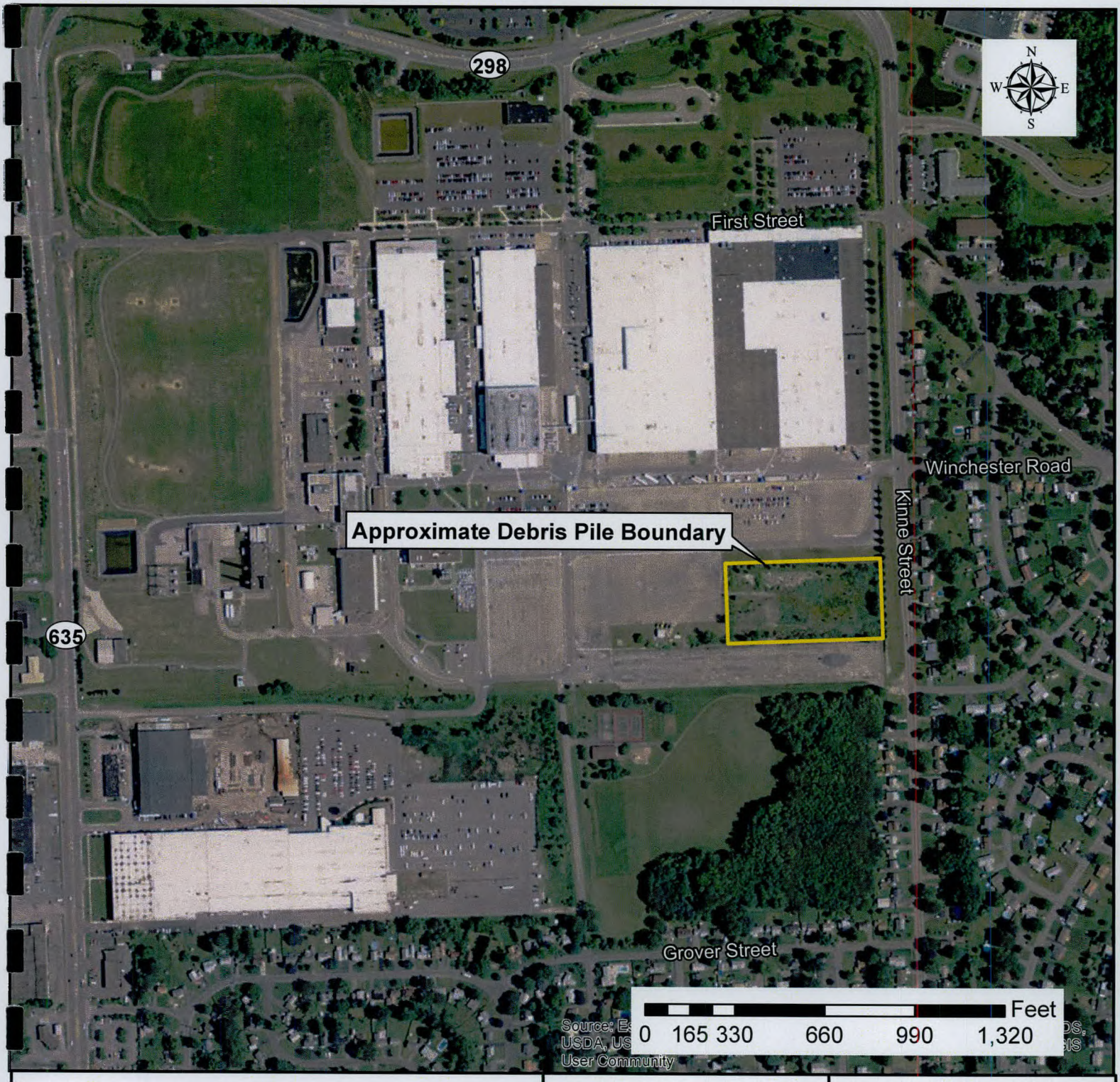
1 Reporting limits for soils, when adjusted for dry weight, will be higher. Detections above the method detection limits but less than reporting limits will be reported and flagged as estimated (J).

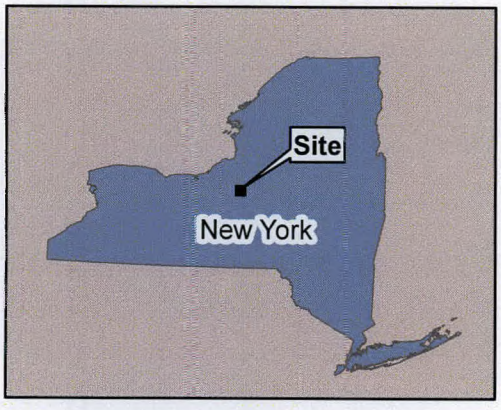
2 Field equipment rinsate blank quantity will vary depending on sample collection rate and types of sampling equipment used; quantity may be greater or less than that shown.

3 Soil samples for volatile organic compounds from all sample depth intervals will be analyzed upon receipt by the lab. The intermediate and deeper sample intervals for all other parameters will be extracted and only analyzed if these parameters are detectable in the shallow interval. The field sample quantity shown is adjusted from the number of analyses that would otherwise be anticipated based on Table 2 assuming that only half of these intermediate and deeper interval samples are analyzed.

4 Maximum number of samples. Analysis of samples collected from three easternmost soil borings will be held pending receipt of other sitewide sample results. If other samples are non-detect, these samples will not be analyzed.

Figures





Source: ArcGIS Bing Maps Aerial, 2012.

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FIGURE 1

SITE LOCATION MAP

SOUTHEAST DEBRIS/SOIL PILE
UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NEW YORK

JUNE 2015

60328507.07.02

LEGEND

- Approximate Fence Location
- Shallow Soil Boring Location Beneath Former Debris Pile (5)
- Sediment Sample Location (5)
- Shallow Soil Boring Location Adjacent to Former Debris Pile (6)
- Shallow Soil Boring Location East of Former Debris Pile (3)
- Soil Boring/Groundwater Monitoring Well Location (Screen 5-15') (5)

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FIGURE 3

SOUTHEAST DEBRIS/SOIL PILE
SAMPLING AND ANALYSIS PLAN
PROPOSED SAMPLE LOCATIONS

APPROXIMATE SCALE (IN FEET):

0' 150' 300'