AECOM
257 West Genesee St.
Buffalo, NY 14202

716-856-5636 tel

October 24, 2017

Harry D. Warner, P.E.
Regional Hazardous Waste Remediation Engineer
NYSDEC Region 7
Division of Environmental Remediation 615
Erie Blvd. West
Syracuse, New York 13204-2400

Subject: **Carrier Corporation, Thompson Road Facility, Syracuse,New York Corrective Action Order — Index CO 7-20051118-4**
Site Registry No.: 734043
Annual Site-Wide Groundwater Monitoring Plan - Revised

Dear Mr. Warner

On behalf of United Technologies Corporation (UTC), AECOM Technical Services, Inc. (AECOM) is hereby submitting a revised *Annual Site-Wide Groundwater Monitoring Plan* for your review and approval.

This document supersedes AECOM's August 2017 submittal. It was revised based on comments received from Mr. Michael Belveg, New York State Department of Environmental Conservation (NYSDEC), in an email dated September 8, 2017, and on subsequent clarification discussions between AECOM and Mr. Belveg. The NYSDEC's comments and our responses are provided below.

Comment #1:

In section 5 of the Narrative, Monitoring Wells 23, 26, 28, 38, and 44 are listed to be sampled for PCBs. Monitoring Wells 26 and 28 are not listed in Table 1, Appendix B, or Figure 3 to be sampled and MW-44 is listed only to be sampled for VOCs in Table 1. Please clarify what will and won't be sampled for VOCs and PCBs.

Response:

The document has been revised to clarify what wells will and will not be sampled for PCBs and VOCs.

Comment #2:

In section 5 of the Narrative, it states that Monitoring Wells 23, 26, 28, 38, and 44 are the only wells that are going to be sampled for PCBs. Table 1 lists MW-19, MW-29, MW-34, and MW-37 as being sampled for PCBs as well. Please clarify what will and won't be sampled for VOCs and PCBs.

Response:

See response to Comment #1.

Comment #3:

Appendix B shows MW-22D as being sampled but the narrative, Table 1, and Figure 3 show the well not being sampled.

Response:

MW-22D will not be sampled. The document has been revised to reflect this.

Comment #4:

Page 1 Introduction – Please clarify that this document, once finalized and approved by the Agencies, will replace the Site Wide Groundwater Monitoring Plan prepared by EnSafe, Inc. in 2009.

Response:

The introduction has been revised as requested.

Comment #5:

Going along with the second bullet above [Sic Comment #2], in Appendix B, MW-19 has a rationale for inclusion. We agree with this rationale and MW-19 should be included for VOC and PCB analysis.

Response:

The document has been revised to show that MW-19 will be analyzed for PCBs and VOCs.

Comment #6:

Going along with the third bullet above, MW-22D should be included for VOC analysis.

Response:

As discussed in our clarification phone call subsequent to our receipt of NYSDEC's comments, it was agreed that MW-22D would not be sampled.

Comment #7:

MW-48 shall be included for VOC analysis as well.

Response:

MW-48 will be included for VOC analysis. The document has been revised to reflect this.

Please call me at (716) 923-1150 if you have any questions.

Sincerely,

Robert E. Murphy, PE
Project Manager
Robert.E.Murphy@AECOM.com

cc: Michael Belveg, NYSDEC
Julia M. Kenney, NYSDOH (hard copy)
Maureen Schuck, NYSDOH
John Wolski, UTC
Kathleen McFadden, UTC
Joe Basile, Carrier Corporation

ANNUAL SITE-WIDE GROUNDWATER MONITORING PLAN

United Technologies Corporation/Carrier Site
Thompson Road, Syracuse, NY

Corrective Action Order – Index CO 7-20051118-4
NYSDEC Site Registry #734043

Project Number: 60546238

October 2017

Prepared for:
United Technologies Corporation
Shared Remediation Services
9 Farm Springs Road
Farmington, Connecticut 06032

Prepared by:
AECOM
257 West Genesee Street
Buffalo
NY, 14202
USA

Table of Contents

Figures

Tables

Appendices

1. Introduction

United Technologies Corporation (UTC) is performing environmental remediation activities at the Carrier Thompson Road Facility (Site) in Syracuse, Onondaga County, New York. UTC retained AECOM Technical Services, Inc. (AECOM) to provide environmental engineering and investigation support services. Environmental work at the Site is being performed in accordance with the January 2006 Corrective Action Order on Consent (CO) negotiated with the New York State Department of Environmental Conservation (NYSDEC).

Groundwater at the Site has been sampled on a routine basis in accordance with the Site-Wide Monitoring Plan (SWMP) prepared by EnSafe, Inc. (EnSafe) in 2009. At that time, there were approximately 20 monitoring wells and 45 piezometers across the Site. Since 2009, investigation activities and interim remedial measures have been implemented and there are now over 95 wells and 38 piezometers located across the Site (see **Figure 1**). The last Site-wide groundwater monitoring event took place in June 2015. Site-wide groundwater sampling in 2016 was postponed until 2017, with NYSDEC approval, because there was a significant amount of investigation work underway in 2016 that included groundwater sampling and reporting.

Considering that additional monitoring wells have been installed since the current SWMP was approved, UTC determined that an update to the SWMP was warranted. This document presents the updated Annual SWMP. Once approved by the NYSDEC and New York State Department of Health (NYSDOH), this document will supersede the SWMP prepared by EnSafe in 2009.

2. Background

2.1 Facility Description

The Site is located in the northeast portion of Syracuse, New York, approximately one mile south of the New York State Thruway. The Site is bordered by New York State Route 298 to the north, Thompson Road to the west, Kinne Street to the east, and a residential area to the south. The Site is relatively flat with a slight slope to the north toward Sanders Creek. The Site is mostly paved, covered by manufacturing and office buildings, or open grassed areas covering former slabs of demolished buildings.

2.2 Site History

Prior to World War II, the property was utilized as farmland. Development of the Site as an industrial facility began around 1942. The facility was initially operated by General Electric and included manufacturing activities related to national defense. Subsequent Site operators included the Defense Corporation - a government-owned World War II manufacturing facility, and Syracuse University.

The Site was purchased in the 1950s by Carrier Corporation (Carrier). The Carrier facility produced a variety of products associated with heating, ventilation, and air conditioning industry. Carrier continues to operate the facility, although several of the large, original buildings have been demolished.

Subsurface investigations have been conducted at the Site since the late 1980's. During the course of these investigations, numerous groundwater monitoring wells and piezometers were installed. Some of the investigations found volatile organic compound (VOC) and/or polychlorinated biphenyl (PCB) impacts in groundwater. Interim remedial measures have been, and continue to be, employed to address identified impacts.

2.3 Geology and Hydrogeology

The Site consists of three primary hydrostratigraphic units as follows:

Upper Water-Bearing Zone

- Fill composed of silty clay with varying amounts of gravel, cobbles, brick, metal, and concrete. This unit ranges in thickness of 1 foot (ft) to 8 ft.
- Silty clay with silt and sand lenses ranging in thickness from 2 ft to 15 ft.

Confining Clay Unit

- Gray clay confining unit ranging in thickness from 7 ft to13 ft.

Lower Water-Bearing Zone

- Clayey silt to silt ranging in thickness from 6 ft to10 ft.
- Red brown fine to medium sand, ranging in thickness from 2 ft to 6 ft.
- Dense clay/silt unit, ranging in thickness from 4 ft to 12 ft.
- Red brown to green gray weathered shale.

The shallow monitoring wells and all piezometers at the Site are screened in the upper water-bearing zone and deep monitoring wells are screened in the lower water-bearing zone. Depth to water in the upper water bearing zone ranges approximately 1 ft to 14 ft below ground surface (bgs). Depth to water in the lower water-bearing zone ranges from artesian conditions to approximately 8 ft bgs. The artesian conditions are present in the former TR-3 Building area. Overall, flow is generally north-northwest across the Site in both the upper and lower water-bearing zones.

2.4 Existing Groundwater Monitoring Well Network

There are currently 95 monitoring wells and 38 piezometers present at the Site. Ten of the 95 monitoring wells are set in the lower water-bearing zone and the remainder are in the upper water-bearing zone. The piezometers are all set in the upper water-bearing zone.

The monitoring points were installed to monitor groundwater conditions at various areas including:

- Former Solid Waste Management Units (SWMUs) 1, 2, 3, and 4, which were concrete and steel storage tanks located in the area between buildings TR-1 and TR-4, north of building TR-6.
- Former Building TR-1, located in the western portion of the Site.
- Former Building TR-2, located in the northwestern portion of the Site, north of former Building TR-1.
- Parking Lot R, located in the north central portion of the Site, a paved portion of former Building TR-3.
- Building TR-3 North Wall/Storm Water Treatment Plant (SWTP), located in the north central portion of the Site.
- Manhole MH3 located inside the SWTP.
- Former Administrative and Research (A&R) Building, located in the northeastern portion of the Site.
- Former Debris Pile, located in the southeastern portion of the Site.

Monitoring wells and piezometers have been installed at the former landfill referred to as Area of Concern (AOC) G west of Thompson Road. However, this SWMP focuses on the Thompson Road Campus portion of the Site where on-going operations occur and therefore does not include AOC G. Conditions at AOC G will be addressed separately under a Resource Conservation and Recovery Act (RCRA) Facility Investigation Work Plan that is currently being reviewed by the NYSDEC.

Groundwater sampling at the Site was conducted semi-annually from 1990 through 1999, and then on an annual basis from 2000 to the most recent event in 2015.

3. Site-Wide Groundwater Monitoring Plan

This Annual SWMP was developed considering the remedial goals and criteria for groundwater presented in the CO:

- Groundwater monitoring must demonstrate compliance with all applicable state and federal water quality standards.
- If groundwater standards are not met, monitoring must demonstrate that natural attenuation continues to reduce the concentration of contaminants in the already contaminated areas; or that contaminant concentrations have stabilized and do not pose a significant threat to human health or the environment.
- Groundwater monitoring must continue to demonstrate that contaminants are not migrating off-site and are not causing a threat to human health or the environment.

This Annual SWMP includes inspection of wells, collection of water levels for use in determining groundwater flow, and collection and analyses of groundwater samples to evaluate groundwater quality.

3.1 Monitoring Point Inspections

All of the 133 monitoring wells and piezometers, listed in **Table 1**, will be inspected annually for general exterior conditions. The 94 locations selected for groundwater level monitoring will also be inspected for interior conditions. The inspections will document the condition of each monitoring point's exterior and interior (as appropriate), such as concrete pad, label, bolts, lid, curb box, riser, annular space, and J-plug. The data from these inspections will be used to recommend appropriate maintenance activities. A copy of the inspection form is included in **Appendix A**.

3.2 Groundwater Monitoring and Sampling

For selection of water level monitoring and groundwater sampling points, the existing monitoring well/piezometer network was considered to consist of the following three subsets:

1. Perimeter Wells – consisting of monitoring wells located along the perimeter of the Site. These locations will be monitored and sampled to assess groundwater conditions up-gradient, down-gradient, and side-gradient of the Site.
2. Area Specific Wells/Piezometers – consisting of monitoring points installed in AOCs, SWMUs, and other areas of investigation. These locations will be monitored and sampled to assess groundwater conditions in the vicinity of known areas of contamination. These specific areas are:
    - Former Building TR-1
    - Former Building TR-3, Parking Lot R and SWTP
    - Former A&R Building
    - Former SWMUs 1 through 4
3. Miscellaneous Interior Wells/Piezometers – consisting of locations not included in items 1 and 2, above.

Not all monitoring wells and piezometers at the Site will be monitored and/or sampled. In areas where the monitoring well and/or piezometer density is high, representative wells and/or piezometers have been selected for the monitoring and sampling program.

3.2.1 Water Level Monitoring

Water levels will be measured on an annual basis from 74 monitoring wells and 20 piezometers. The monitoring will include determination of the thickness of light non-aqueous phase liquid (LNAPL), where present. Both the lower and

upper water-bearing zones will be monitored. The monitoring wells and piezometers selected for water level monitoring are presented in **Table 1** and **Figure 2.** The rationale for monitoring well/piezometer selection is included as **Appendix B**.

The overall purpose of the water level monitoring effort is to generate potentiometric contour maps of both the upper and lower water-bearing zones that will be used to determine direction of groundwater flow across the Site. However, some areas require closer evaluation for various purposes. Examples of these are as follows:

- Monitoring points have been included in the former A&R Building area to evaluate the apparent groundwater mounding condition observed during the A&R area investigation in 2016.
- Monitoring points have been included in the former Building TR-1 and TR-3 areas to evaluate LNAPL thickness and potential migration.
- Monitoring points have been included in and around the former Building TR-3 area to evaluate the horizontal well capture zone.

3.2.2 Groundwater Sampling

Groundwater samples will be collected annually from 32 monitoring wells. The wells were selected based on the following rationale:

- Historical presence of LNAPL, PCBs, and/or VOCs.
- Wells historically included in the CO monitoring well network were weighted heavier for inclusion in sampling. These wells have a long history of analyses and they may be useful in determining trends in contaminant concentrations.
- Spatial distribution.

The rationale for monitoring well selection is discussed below and summarized in **Appendix B**. The locations are shown in **Table 1** and **Figure 3**. Because they are not properly constructed as monitoring wells, no piezometers were selected for groundwater sampling.

3.2.2.1 Perimeter Well Network

Twelve monitoring wells located along the Site perimeter were selected to evaluate whether VOC contaminants are migrating on- or off-site. Also, one of the 12 wells, MW-19, will be sampled for PCBs.

3.2.2.2 Former A&R Building Area

Two of the six monitoring wells in the former A&R Building area were selected for VOC sampling:

- Monitoring well AR-MW-02 was selected as a downgradient monitoring point based on Site-wide groundwater flow.
- When the wells were sampled in 2016 monitoring well AR-MW-06 was the only well that had an exceedance of groundwater criteria in this AOC. AR-MW-06 contained the VOCs cis-1,2-dichloroethene, toluene, trichloroethene, and vinyl chloride at concentrations exceeding groundwater criteria.

3.2.2.3 Former Building TR-1 Area

There are 18 monitoring wells in the former Building TR-1 area. Of the 18 monitoring wells, three were not considered for sampling because of the historical presence of LNAPL. The following monitoring wells were selected for PCB and VOC sampling:

- Monitoring well MW-23, which historically contained elevated levels of VOC contamination in the former Building TR-1 area.

- Monitoring well MW-26, located within an area where elevated VOCs were previously detected, also contained PCBs.
- Monitoring well MW-38 is on the downgradient side of the former building and will be used to evaluate if contaminants are migrating from the former Building TR-1 area.

3.2.2.4 Former Building TR-3/Parking Lot R/SWTP Area

There are 17 monitoring wells in the former Building TR-3/Parking Lot R/SWTP area. Of these wells, two were not considered for sampling because they historically showed the presence of LNAPL. Of the remaining 15 wells, the following nine wells were selected for VOC sampling:

- Monitoring well MW-18 is located on the north side of the SWTP. Groundwater analytical data dating back to 2001 show that the well had some of the highest VOC concentrations in the area and that those concentrations have decreased over time. This well was included to further evaluate contaminant concentration trends.
- Monitoring well MW-44 is located to the southwest and MW-45 to the south of the Building TR-3/SWTP area and will function as upgradient VOC monitoring points. Well MW-44 will also be sampled for PCBs.
- Monitoring well MW-48 is located on the south side of the SWTP, an area where elevated VOCs have historically been detected.
- Monitoring wells MW-50 and MW-57 are located south of the sheet pile wall will provide coverage on the upgradient side of the sheet pile wall.
- Monitoring wells MW-58 and MW-66 are located north of the sheet pile wall and south of Sanders Creek. These wells were selected to monitor groundwater conditions downgradient of the sheet pile wall. These wells historically exhibited elevated levels of VOC contamination.
- Pumping well TR3-PW-01, located south of the sheet pile wall, was included because it exhibited a trichloroethene concentration of 195,000 micrograms per liter (µg/L) when sampled in 2016.

It is noted that two of the 11 proposed perimeter wells (MW-79 and TR3-MW-02), are located north of Sanders Creek and will be used to monitor groundwater quality downgradient of the former Building TR-3/SWTP area.

3.2.2.5 SWMUs 1 through 4

Two monitoring wells in this former SWMU area were selected for VOC sampling:

- Monitoring wells MW-03S and MW-03D are located in the area of the former SWMUs. Groundwater sampling of these two wells dates back to 1985. The historical analytical results show that the once elevated concentrations of chlorinated VOCs have decreased in shallow well MW-03S. Minor chlorinated VOC impacts have been sporadically detected in deep well MW-03D.

Wells MW-13D2 and MW-22D were not selected for sampling. Well MW-13D was not included because, although it historically contained elevated concentrations of chlorinated VOCs, there were no exceedances of groundwater criteria in the nine times it was sampled since 2009. This well is also located in close proximity to well MW-3D.

Well MW-22D is located upgradient of the former SWMU area and has had no groundwater exceedances in the five times it was sampled since June 2012.

3.2.2.6 Miscellaneous Interior Wells

In early 2017, 16 monitoring wells were installed at locations across the Site. Generally, the wells were located in close proximity to buildings in areas that had not been previously investigated, to provide groundwater data near buildings to screen for potential vapor intrusion issues, to enhance the Site perimeter monitoring well network, or to supplement groundwater information to fill in data gaps or provide data where no, or limited, data existed.

Monitoring wells MW-69, MW-70, MW-75, and MW-84 were installed to provide VOC groundwater quality data for locations within the interior of the Site and were selected for inclusion in this Annual SWMP.

- Monitoring well MW-69 is located between buildings TR-4 and TR-6.
- Monitoring well MW-70 is located within the footprint of former Building TR-2.
- Monitoring well MW-75 is located between buildings TR-5 and TR-19.
- Monitoring well MW-84 is located between buildings TR-4 and TR-5.

4. Monitoring and Sampling Frequency

Monitoring and sampling will be performed on an annual basis. A complete round of water levels will be recorded prior to initiating sampling activities.

5. Proposed Analyses

Monitoring wells selected for laboratory analysis are presented in **Table 1**. A summary of proposed analyses and quality assurance/quality control (QA/QC) samples is presented on **Table 2**. **Table 3** presents the sample bottle, preservation, and holding time requirements. All samples will be handled and shipped following United States Environmental Protection Agency (USEPA) chain-of-custody (COC) procedures.

5.1 Proposed VOC Analyses

Based on a review of historical groundwater analytical data, as shown in **Table 1**, 32 locations will be analyzed for VOCs. Historical investigations have included other parameters, however, VOCs (predominantly chlorinated) were the only parameters that were commonly detected at locations across the Site and therefore warrant analysis at all SWMP sampling locations.

5.2 Proposed PCB Analyses

PCBs impacts are known to be present at the Site. Based on the review of Site analytical data, although PCBs have been detected in soil samples, those impacts have not resulted in significant groundwater contamination. To assess which locations should be analyzed for PCBs, AECOM reviewed the *Site-Wide Groundwater Monitoring Report* – June 2015 prepared by EnSafe and groundwater data from investigations performed by AECOM in 2016 and 2017. Review of the data showed that 78 monitoring wells were analyzed for PCBs, but PCBs were detected in only two samples.

- The 2015 EnSafe report stated that 45 monitoring wells were analyzed for PCBs, but PCBs were only detected in one sample, MW-23, which is located in the former Building TR-1 area. However, the historical data provided in the 2015 EnSafe shows that PCBs had been detected in wells MW-26, MW-28, MW-38, and MW-44 in June 2014 but were not detected in these wells in June 2015. Considering these results, PCB analyses will continue for wells MW-23, MW-26, MW-38, and MW-44. MW-28 is not included because the well is located near MW-26.
- Groundwater samples from 33 locations installed by AECOM in 2016 and 2017 were analyzed for PCBs. PCBs were detected at only one location, AR-SB-04, and the detection of 0.063 µg/L was below the groundwater criterion of 0.9 µg/L. However, the detection was in an unfiltered sample from a temporary piezometer. The accompanying filtered sample from this location showed no PCB detection. This suggests that the PCB detection in the unfiltered sample was likely due to the presence of fines in the sample and was not indicative of dissolved phase groundwater quality. Because AR-SB-04 is a piezometer and is not constructed as a monitoring well (e.g., there is no filter pack), it will not be included in the sampling program.

Monitoring well MW-19 is a perimeter well that will be analyzed for PCBs (and VOCs) due to its location downgradient of the Building TR-1 area.

Based on this review, monitoring wells to be analyzed for PCBs are: MW-19, MW-23, MW-26, MW-38, and MW-44.

Note that PCB analyses will be performed on filtered and unfiltered samples.

6. Field Procedures

Field activities will be conducted in accordance with the Site-specific Generic Site Investigation Procedures (GSIP), Health and Safety Plan (HASP), and Quality Assurance Project Plan (QAPP). Water levels will be recorded using an oil/water interface probe. Groundwater sampling will be conducted following USEPA/NYSDEC approved low-flow sampling procedures. If a well scheduled for sampling contains LNAPL it will not be sampled. Samples scheduled for PCB analyses will filtered in the field.

6.1 Disposition of Investigation-Derived Waste

Groundwater generated during well purging and sampling activities will be managed as investigation-derived waste (IDW). Groundwater IDW will be treated onsite at the SWTP. The interface probe will be decontaminated by spraying with Alconox and potable water solution, wiping with paper towels, followed by a potable water rinse (wiping the probe with clean paper towels will prevent the accumulation of soapy water which cannot be treated at the SWTP).

Solid IDW (e.g., tubing, paper towels, and personal protective equipment) will be disposed of in the solid waste dumpster at the SWTP.

7. Quality Assurance/Quality Control

A QAPP has been prepared in support of monitoring and sampling activities to check the accuracy and precision of data collection 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).

7.1 Scope of the QAPP

The QAPP was prepared to provide QA guidelines to be implemented during investigation and sampling activities. The document may be modified for subsequent phases of work, as necessary. The QAPP provides:

- A means to communicate to the persons executing the various activities 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 work in terms of the methods used, calibration standards and frequencies planned, and auditing planned.
- A document that can be used by project management 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.

The QAPP addresses the QA/QC aspects of the procedures involved in the collection, preservation, packaging, and transportation of samples, field testing, record keeping, data management, COC procedures, laboratory analyses,

and other necessary matters to assure that the investigation activities, once completed, will yield data whose integrity can be verified.

7.2 Objectives for Measurement Data

DQOs for measurement data in terms of sensitivity and precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters 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.

7.3 Data Usability Evaluation

Data validation will be performed by an AECOM chemist using 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 method. Analytical 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. The data validator will also evaluate the overall completeness of the data package. Completeness checks will be administered on data to determine whether deliverables specified in the QAPP are present. The data validator will determine whether all required items are present and request copies of missing deliverables. The data validation results will be presented in a Data Usability Summary Report (DUSR).

8. Reporting

AECOM will prepare a groundwater monitoring and sampling report summarizing the findings of those activities. The report will include results associated with the data collection and field efforts. The report will include, but not be limited to, the following components:

- Purpose and scope of the work.
- Organization(s) involved.
- Amount and type of data collected.
- Quality (reliability) of data collected.
- Methods of monitoring, sampling and equipment employed.
- Methods of analyses and interpretations.
- Figures showing locations of field activities.
- Tabulated analytical results.
- Tabulated depth-to-groundwater measurements.
- Sampling purge logs.
- Results of monitoring well/piezometer inspections.
- Evaluation of field results and data.
- Figures showing analytical results compared to applicable groundwater criteria.
- Groundwater potentiometric surface maps (upper and lower water-bearing zones) with flow directions.
- A discussion of trends identified in the data (if any) and recommendations for future groundwater monitoring.
- Selection of wells for decommissioning (if any).
- Proposed modifications to the Annual SWMP (if any).

9. Implementation Schedule

Field work will be scheduled upon final NYSDEC approval of this document.

10. Future Modifications

This monitoring plan may warrant periodic modification based on results of the annual monitoring or findings of future investigations or remedial activities. Prior to modification, UTC will present the proposed changes to the NYSDEC for review and approval.

N

SANDERS CREEK

CARRIER PKWY

SWTP

FIRST ST

THOMPSON RD

KINNE ST

VERIZON SERVICE RD

MW-05R MW-80 MW-17 MW-21 MW-65 MW-42 MW-14D MW-14 MW-68 MW-67 MW-58 MW-66 MW-57 MW-43 MW-56 TR3-MW-01 MW-55 MW-54D MW-79 TR3-MW-02 MW-53 PLR061 MW-59 MW-18 MW-11 MW-60 PLR060 MW-52 TR3-PW-02 MW-50 MW-62 TR3-PW-01 TR3-GB-03 MW-61 MW-47 MW-46 MW-54 PLR058 MW-48 PLR056 PLR057 B00107 B00109 B00108 B00102 B00101 MW-51 AR-SB-04 AR-SB-02 AR-MW-01 AR-MW-02 AR-MW-03 AR-MW-04 AR-MW-06 AR-MW-05 MW-45 B00104 MW-20 B00110 MW-41D B00105 B00106 PLR002 PLR001 B00103 MW-44 MW-49 MW-70 MW-10 MW-78 MW-81 MW-82 MW-83 MW-40D MW-38 MW-06 FDPZ02 FDPZ04 MW-37 FDPZ01 FDPZ03 MW-19 MW-36 MW-39 MW-73 MW-23 MW-24 MW-35D MW-31 DCDPZ04 DCDPZ02 MW-33 MW-34 DCDPZ01 DCDPZ03 MW-32 MW-30 MW-26 SSIPZ04 SSIPZ03 MW-28 SSIPZ02 MW-29 SSIPZ01 MW-25 MW-27 SSIPZ05 MW-03S MW-03D MW-13D2 MW-22D MW-71 MW-69 MW-84 MW-08 MW-75 MW-77 MW-76

TR-1 TR-2 TR-3 TR-4 TR-5 TR-6 TR-7 TR-7A TR-6A TR-8 TR-10 TR-10A TR-11 TR-12 TR-13 TR-14 TR-18 TR-18S TR-19 TR-20 TR-21 TR-21A TR-23 A&R

B00116 B00115 B00114 B00113 B00111 B00112

MW-72 MW-09 MW-74 MW-16D

DP-MW-01 DP-MW-02 DP-MW-04 DP-MW-05 DP-MW-03

FORMER DEBRIS PILE AREA

Legend

- Monitoring Well
- Piezometer
- Pump Well
- Building

300 0 300 Feet

SITE-WIDE GROUNDWATER MONITORING PLAN
UTC/CARRIER SITE
SITE-WIDE GROUNDWATER NETWORK

AECOM

FIGURE 1

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SITE-WIDE\MONITORING PLAN\01 SITE-WIDE GW NETWORK.mxd 10/24/2017

N

SANDERS CREEK

CARRIER PKWY

SWTP

FIRST ST

THOMPSON RD

KINNE ST

VERIZON SERVICE RD

MW-05R MW-17 MW-21 MW-42 MW-43 MW-57 TR3-MW-02 MW-66 MW-58 MW-68 MW-79 MW-18 MW-14D MW-14 TR3-PW-02 MW-50 TR-3 MW-62 TR3-PW-01 MW-48 MW-46 MW-47 MW-49 MW-70 TR-2 MW-44 MW-45 B00104 MW-20 B00103 B00110 MW-41D B00105 B00106 PLR001 B00107 B00109 B00108 A&R AR-SB-04 AR-SB-02 AR-MW-01 AR-MW-02 AR-MW-03 AR-MW-04 AR-MW-06 AR-MW-05

MW-10 MW-40D MW-38 MW-06 MW-37 MW-36 MW-73 MW-19 MW-23 MW-24 MW-35D MW-31 DCDPZ04 DCDPZ02 MW-33 MW-34 DCDPZ01 DCDPZ03 MW-32 MW-30 MW-26 SSIPZ04 SSIPZ03 MW-28 SSIPZ02 MW-29 SSIPZ01 MW-25 MW-27 SSIPZ05 TR-1 MW-71

TR-18 TR-18S TR-4 TR-5 MW-03S MW-03D MW-13D2 MW-22D TR-6 MW-69 TR-7 TR-7A TR-6A MW-74 TR-21 TR-21A TR-11 TR-10 MW-72 MW-09 TR-8 TR-13 TR-23 TR-10A TR-12 TR-14 MW-16D

MW-81 MW-78 MW-82 MW-83 TR-19 TR-20 MW-77 MW-75 MW-84 MW-08 MW-76

FORMER DEBRIS PILE AREA DP-MW-04

Legend

- Monitoring Well
- Piezometer
- Pump Well
- Building

300 0 300 Feet

SITE-WIDE GROUNDWATER MONITORING PLAN
UTC/CARRIER SITE
PROPOSED WATER LEVEL MONITORING NETWORK

AECOM

FIGURE 2

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SITE-WIDE\MONITORING PLAN\02 PROPOSED WL MONITORING NETWORK.mxd 10/24/2017

N

SANDERS CREEK

CARRIER PKWY

FIRST ST

THOMPSON RD

KINNE ST

VERIZON SERVICE RD

MW-17
MW-21
MW-14
MW-79
TR3-MW-02
MW-58
MW-66
MW-57
MW-18
MW-50
TR-3
TR3-PW-01
SWTP
MW-48
AR-MW-02
A&R
AR-MW-06
MW-70
TR-2
MW-44
MW-45
PARKING LOT R
MW-10
MW-38
MW-19
MW-23
TR-18
TR-18S
MW-03S
MW-03D
MW-26
TR-4
TR-5
TR-19
TR-20
MW-77
MW-75
MW-84
MW-76
TR-1
MW-69
TR-6
MW-71
TR-7
TR-7A
TR-6A
TR-21
TR-21A
TR-11
TR-10
MW-09
TR-8
TR-13
TR-23
TR-10A
TR-12
TR-14
FORMER DEBRIS
PILE AREA
DP-MW-04

Legend

- Monitoring Well
- Pump Well
- Building

300 0 300 Feet

SITE-WIDE GROUNDWATER MONITORING PLAN
UTC/CARRIER SITE
PROPOSED GROUNDWATER SAMPLING NETWORK

AECOM

FIGURE 3

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\SITE-WIDE\MONITORING PLAN\03 PROPOSED GW SAMPLING NETWORK.mxd 10/24/2017

TABLE 1
UTC/CARRIER SITE
SITE-WIDE GROUNDWATER MONITORING PROGRAM
PROPOSED WELLS

Area	Monitoring Well/ Piezometer	Water-bearing Zone (Upper/ Lower)	Well Diameter (inches)	Proposed Wells For:		
				Water Levels	VOC Analysis	PCB Analysis
Perimeter	DP-MW-04	Upper	2	x	x	
Perimeter	MW-05R	Upper	2	x		
Perimeter	MW-09	Upper	2	x	x	
Perimeter	MW-10	Upper	2	x	x	
Perimeter	MW-14	Upper	2	x	x	
Perimeter	MW-14D	Lower	2	x		
Perimeter	MW-16D	Lower	2	x		
Perimeter	MW-17	Upper	2	x	x	
Perimeter	MW-19	Upper	2	x	x	x
Perimeter	MW-21	Upper	2	x	x	
Perimeter	MW-42	Upper	2	x		
Perimeter	MW-71	Upper	2	x	x	
Perimeter	MW-73	Upper	2	x		
Perimeter	MW-76	Upper	2	x	x	
Perimeter	MW-77	Upper	2	x	x	
Perimeter	MW-79	Upper	2	x	x	
Perimeter	TR3-MW-02	Upper	2	x	x	
Area Subtotal				17	12	1
A&R	AR-MW-01	Upper	2	x		
A&R	AR-MW-02	Upper	2	x	x	
A&R	AR-MW-03	Upper	2	x		
A&R	AR-MW-04	Upper	2	x		
A&R	AR-MW-05	Upper	2	x		
A&R	AR-MW-06	Upper	2	x	x	
A&R	AR-SB-02	Upper	1	x		
A&R	AR-SB-04	Upper	1	x		
Area Subtotal				8	2	0
TR-1	DCDPZ01	Upper	1	x		
TR-1	DCDPZ02	Upper	1	x		
TR-1	DCDPZ03	Upper	1	x		
TR-1	DCDPZ04	Upper	1	x		
TR-1	MW-06	Upper	2	x		
TR-1	MW-23	Upper	2	x	x	x
TR-1	MW-24	Upper	2	x		
TR-1	MW-25	Upper	4	x		
TR-1	MW-26	Upper	2	x	x	x
TR-1	MW-27	Upper	2	x		
TR-1	MW-28	Upper	2	x		
TR-1	MW-29	Upper	4	x		
TR-1	MW-30	Upper	4	x		
TR-1	MW-31	Upper	2	x		
TR-1	MW-32	Upper	2	x		
TR-1	MW-33	Upper	2	x		
TR-1	MW-34	Upper	2	x		
TR-1	MW-35D	Lower	2	x		
TR-1	MW-36	Upper	4	x		
TR-1	MW-37	Upper	2	x		
TR-1	MW-38	Upper	2	x	x	x
TR-1	MW-40D	Lower	2	x		
TR-1	SSIPZ01	Upper	1	x		
TR-1	SSIPZ02	Upper	1	x		
TR-1	SSIPZ03	Upper	1	x		
TR-1	SSIPZ04	Upper	1	x		
TR-1	SSIPZ05	Upper	1	x		
Area Subtotal				27	3	3

TABLE 1
UTC/CARRIER SITE
SITE-WIDE GROUNDWATER MONITORING PROGRAM
PROPOSED WELLS

Area	Monitoring Well/ Piezometer	Water-bearing Zone (Upper/ Lower)	Well Diameter (inches)	Proposed Wells For:		
				Water Levels	VOC Analysis	PCB Analysis
TR-3 and Parking Lot R	B001-03	Upper	1	x		
TR-3 and Parking Lot R	B001-04	Upper	1	x		
TR-3 and Parking Lot R	B001-05	Upper	1	x		
TR-3 and Parking Lot R	B001-06	Upper	1	x		
TR-3 and Parking Lot R	B001-07	Upper	1	x		
TR-3 and Parking Lot R	B001-08	Upper	1	x		
TR-3 and Parking Lot R	B001-09	Upper	1	x		
TR-3 and Parking Lot R	B001-10	Upper	1	x		
TR-3 and Parking Lot R	MW-18	Upper	2	x	x	
TR-3 and Parking Lot R	MW-20	Upper	2	x		
TR-3 and Parking Lot R	MW-41D	Lower	2	x		
TR-3 and Parking Lot R	MW-43	Upper	2	x		
TR-3 and Parking Lot R	MW-44	Upper	2	x	x	x
TR-3 and Parking Lot R	MW-45	Upper	2	x	x	
TR-3 and Parking Lot R	MW-46	Upper	2	x		
TR-3 and Parking Lot R	MW-47	Upper	2	x		
TR-3 and Parking Lot R	MW-48	Upper	2	x	x	
TR-3 and Parking Lot R	MW-50	Upper	2	x	x	
TR-3 and Parking Lot R	MW-57	Upper	2	x	x	
TR-3 and Parking Lot R	MW-58	Upper	2	x	x	
TR-3 and Parking Lot R	MW-62	Upper	2	x		
TR-3 and Parking Lot R	MW-66	Upper	2	x	x	
TR-3 and Parking Lot R	MW-68	Upper	2	x		
TR-3 and Parking Lot R	PLR001	Upper	1	x		
TR-3 and Parking Lot R	TR3-PW-01	Upper	4	x	x	
TR-3 and Parking Lot R	TR3-PW-02	Upper	4	x		
Area Subtotal				26	9	1
SWMU 1-4	MW-03D	Lower	2	x	x	
SWMU 1-4	MW-03S	Upper	2	x	x	
SWMU 1-4	MW-13D2	Lower	2	x		
SWMU 1-4	MW-22D	Lower	2	x		
Area Subtotal				4	2	0
Miscelllaneous Interior	MW-08	Upper	2	x		
Miscelllaneous Interior	MW-49	Upper	2	x		
Miscelllaneous Interior	MW-69	Upper	2	x	x	
Miscelllaneous Interior	MW-70	Upper	2	x	x	
Miscelllaneous Interior	MW-72	Upper	2	x		
Miscelllaneous Interior	MW-74	Upper	2	x		
Miscelllaneous Interior	MW-75	Upper	2	x	x	
Miscelllaneous Interior	MW-78	Upper	2	x		
Miscelllaneous Interior	MW-81	Upper	2	x		
Miscelllaneous Interior	MW-82	Upper	2	x		
Miscelllaneous Interior	MW-83	Upper	2	x		
Miscelllaneous Interior	MW-84	Upper	2	x	x	
Area Subtotal				12	4	0
Total				94	32	5

Notes:
A&R - Administration and Research
PCB - Polychlorinated biphenyl
SWMU - Solid Waste Management Unit
VOC - Volatile Organic Compound

Table 2

Summary of Proposed Samples

UTC/Carrier Site-wide Groundwater Monitoring Plan

MATRIX/ANALYSIS	Analytical Method	Field Sample Quantity	Matrix Spike (MS) or LCS	MS Duplicate or Matrix Duplicate	Field Duplicate	Equipment/ Field Blank	Trip Blank	Total Analyses
Groundwater Samples								
Volatile Organics	SW-846 8260C	32	2	2	3	3	5	47
Polychlorinated Biphenyls (Field Filtered)	SW-846 8082A	5	1	1	1	1	0	9
Polychlorinated Biphenyls (Unfiltered)	SW-846 8082A	5	1	1	1	1	0	9

Notes:

PCBs = Polychlorinated Biphenyls

LCS = Laboratory Control Sample

MS/MSD - 1/20

Duplicates - 1/10

Equipment/Field Blank - 1/10

Trip Blank - 1/day

Table 3
Sample Bottle, Volume, Preservation, and Holding Time Summary
UTC/Carrier Site-wide Well Network

MATRIX/ANALYSIS	Sample Prep Method (1)	Analytical Method (1)	Sample Bottles		Preservation	Holding Time	
			Material	Size		Extraction	Analysis
Groundwater Samples							
Volatile Organics	SW-846 5030B	SW-846 8260C	G	40 mL VOA vial w/ septa	HCl to pH<2	NA	14 days
Polychlorinated Biphenyls	SW-846 3520C	SW-846 8082A	G	1-L amber	None	7 days	40 days from extraction

Notes:

(1) SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. USEPA SW-846. Complete through Update IV, March 2009.

G - Glass

NA - Not Applicable

VOA - Volatile Organic Analysis

APPENDIX A
MONITORING POINT INSPECTION FORM

MONITORING POINT INSPECTION FORM

SITE NAME: _____

JOB#: _____

DATE: _____

TIME: _____

WELL ID: _____

INSPECTOR (PRINT): _____

EXTERIOR INSPECTION CONDITION

PROTECTIVE CASING/ CURB BOX: _____

LOCK/HASP CONDITION: _____ LOCK KEY #: _____

HINGE/ LID: _____ GASKET/SEAL : _____

SECURITY BOLTS TYPE: _____

SECURITY BOLTS : _____ THREAD CONDITION: _____

WELL PAD: _____ BOLLARDS: _____

LABEL/ ID CONDITION: _____

MAINTENANCE PERFORMED (e.g., anti seize applied, re-tapping bolt holes, bolt replacement, gasket replacement, etc.)

INTERIOR INSPECTION CONDITION
(Wells Selected for Water Level Monitoring Only)

WELL CASING INTERIOR: _____

WELL RISER: _____

ANNULAR SPACE: _____

J PLUG: _____

WATER LEVEL: _____ DEPTH TO BOTTOM: _____

HARD/SOFT BOTTOM: _____

MAINTENANCE PERFORMED (e.g., removed water, removed bentonite, sorbed sheen, replaced J plug, etc.)

ADDITIONAL COMMENTS:

INSPECTOR (SIGNATURE): _____

PROJECT MANAGER APPROVAL: _____

APPENDIX B
SITE-WIDE GROUNDWATER MONITORING PROGRAM
RATIONALE TABLE

APPENDIX B
UTC/CARRIER
SITE-WIDE GROUNDWATER MONITORING PROGRAM RATIONALE

Area	Monitoring Well/ Piezometer	Water-bearing Zone (Upper/ Lower)	Well Diameter (inches)	Historical LNAPL (Y/N)	Exceedance of VOC Criteria Last Time Sampled?	Historical PCB Detection?	Consent Order Well (Y/N)	Proposed Wells For:			Rationale for Inclusion or Exclusion- Water Levels	Rationale for Inclusion- Sampling
								Water Levels	Sampling			
									VOCs	PCBs		
Perimeter	DP-MW-04	Upper	2	NO	NO	NO	NO	x	x		Upgradient location, Debris Pile Well	Upgradient location, Debris Pile Well
Perimeter	MW-05R	Upper	2	NO	NO	NO	YES	x			Spatial distribution, northwest corner	
Perimeter	MW-09	Upper	2	NO	NO	NO	YES	x	x		Spatial distribution, upgradient well near southwest corner	Spatial distribution, upgradient well near southwest corner
Perimeter	MW-10	Upper	2	NO	NO	NO	YES	x	x		Spatial distribution, northwest corner	Spatial distribution, northwest corner
Perimeter	MW-11	Upper	2	NO	NO	NO	YES				Excluded - Located in TR-3 Area, sufficient coverage in this area	
Perimeter	MW-14	Upper	2	NO	NO	NO	YES	x	x		Spatial distribution, north central	Spatial distribution, north central
Perimeter	MW-14D	Lower	2	NO	NO	NO	YES	x			Lower well	
Perimeter	MW-16D	Lower	2	NO	NO	NO	YES	x			Lower well	
Perimeter	MW-17	Upper	2	NO	NO	NO	YES	x	x		Spatial distribution, northwest corner	Spatial distribution, northwest corner
Perimeter	MW-19	Upper	2	NO	NO	NO	YES	x	x	x	Spatial distribution, western	Spatial distribution, western. Also to be used to as a TR-1 downgradient location for VOC and PCB analyses
Perimeter	MW-21	Upper	2	NO	YES	NO	YES	x	x		Spatial distribution, western	Spatial distribution, western
Perimeter	MW-42	Upper	2	NO	YES	NO	NO	x			Spatial distribution, north central	
Perimeter	MW-59	Upper	2	NO	NO	NO	NO				Excluded - Located in TR-3 Area, sufficient coverage in this area	
Perimeter	MW-65	Upper	2	NO	YES	NO	NO				Excluded - Located north of former TR-2, MW-21 and MW-42 are representative of area	
Perimeter	MW-71	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, western	Spatial distribution, western
Perimeter	MW-73	Upper	2	NO	NO	NO	NO	x			Spatial distribution, western	
Perimeter	MW-76	Upper	2	NO	NO	NO	NO	x	x		Spatial distribution, eastern	Spatial distribution, eastern
Perimeter	MW-77	Upper	2	NO	NO	NO	NO	x	x		Spatial distribution, eastern	Spatial distribution, eastern
Perimeter	MW-79	Upper	2	NO	NO	NO	NO	x	x		Spatial distribution, north central	Spatial distribution, north central
Perimeter	MW-80	Upper	2	NO	NO	NO	NO				Excluded - Located north of former TR-2 and north of Sanders Creek, MW-21 representative of area	
Perimeter	TR3-MW-01	Upper	2	NO	NO	NO	NO				Excluded - Located north of former TR-3 and north of Sanders Creek, TR-3-MW-02 representative of area	
Perimeter	TR3-MW-02	Upper	2	NO	NO	NO	NO	x	x		Spatial distribution, north of TR-3, north of Sanders Creek	Spatial distribution, north of TR-3, north of Sanders Creek
Area Subtotal								17	12	1		
A&R	AR-MW-01	Upper	2	NO	NO	NO	NO	x			All A&R wells included for water levels to assess mounding condition observed during investigation	
A&R	AR-MW-02	Upper	2	NO	NO	NO	NO	x	x		All A&R wells included for water levels to assess mounding condition observed during investigation	Theoretical down gradient location
A&R	AR-MW-03	Upper	2	NO	NO	NO	NO	x			All A&R wells included for water levels to assess mounding condition observed during investigation	
A&R	AR-MW-04	Upper	2	NO	NO	NO	NO	x			All A&R wells included for water levels to assess mounding condition observed during investigation	
A&R	AR-MW-05	Upper	2	NO	NO	NO	NO	x			All A&R wells included for water levels to assess mounding condition observed during investigation	
A&R	AR-MW-06	Upper	2	NO	YES	NO	NO	x	x		All A&R wells included for water levels to assess mounding condition observed during investigation	Exceedance of GW criteria last time sampled
A&R	AR-SB-02	Upper	1	NO	NO	NO	NO	x			All A&R wells included for water levels to assess mounding condition observed during investigation	
A&R	AR-SB-04	Upper	1	NO	NO	YES	NO	x			All A&R wells included for water levels to assess mounding condition observed during investigation	
Area Subtotal								8	2	0		
TR-1	DCDPZ01	Upper	1	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL	
TR-1	DCDPZ02	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby	
TR-1	DCDPZ03	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby	
TR-1	DCDPZ04	Upper	1	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL	
TR-1	FDPZ01	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - No historic presence of LNAPL, sufficient coverage in this area	
TR-1	FDPZ02	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - No historic presence of LNAPL, sufficient coverage in this area	
TR-1	FDPZ03	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - No historic presence of LNAPL, sufficient coverage in this area	
TR-1	FDPZ04	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - No historic presence of LNAPL, sufficient coverage in this area	
TR-1	MW-06	Upper	2	NO	NO	NO	YES	x			Downgradient of TR-1 area	
TR-1	MW-23	Upper	2	NO	YES	YES	NO	x	x	x	LNAPL nearby	Elevated VOCs, PCBs historically detected.
TR-1	MW-24	Upper	2	NO	YES	NO	NO	x			LNAPL nearby	
TR-1	MW-25	Upper	4	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL	
TR-1	MW-26	Upper	2	NO	YES	YES	NO	x	x	x	LNAPL nearby	Historical PCB presence
TR-1	MW-27	Upper	2	NO	YES	NO	NO	x			LNAPL nearby	
TR-1	MW-28	Upper	2	NO	YES	YES	NO	x			LNAPL nearby	
TR-1	MW-29	Upper	4	NO	YES	NO	NO	x			LNAPL nearby	
TR-1	MW-30	Upper	4	NO	YES	NO	NO	x			LNAPL nearby	
TR-1	MW-31	Upper	2	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL	
TR-1	MW-32	Upper	2	NO	YES	NO	NO	x			LNAPL nearby	

APPENDIX B
UTC/CARRIER
SITE-WIDE GROUNDWATER MONITORING PROGRAM RATIONALE

Area	Monitoring Well/ Piezometer	Water-bearing Zone (Upper/ Lower)	Well Diameter (inches)	Historical LNAPL (Y/N)	Exceedance of VOC Criteria Last Time Sampled?	Historical PCB Detection?	Consent Order Well (Y/N)	Proposed Wells For:			Rationale for Inclusion or Exclusion- Water Levels	Rationale for Inclusion- Sampling
								Water Levels	Sampling			
									VOCs	PCBs		
TR-1	MW-33	Upper	2	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL	
TR-1	MW-34	Upper	2	NO	YES	NO	NO	x			LNAPL nearby	
TR-1	MW-35D	Lower	2	NO	NO	NO	NO	x			Lower well	
TR-1	MW-36	Upper	4	NO	YES	NO	NO	x			LNAPL nearby	
TR-1	MW-37	Upper	2	NO	YES	NO	NO	x			LNAPL nearby	
TR-1	MW-38	Upper	2	NO	YES	YES	NO	x	x	x	Downgradient of TR-1 area	Downgradient location, PCBs historically detected
TR-1	MW-39	Upper	2	NO	YES	NO	NO				Excluded - MW-38 nearby and representative of area	
TR-1	MW-40D	Lower	2	NO	NO	NO	NO	x			Lower well	
TR-1	SSIPZ01	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby	
TR-1	SSIPZ02	Upper	1	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL	
TR-1	SSIPZ03	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby	
TR-1	SSIPZ04	Upper	1	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL	
TR-1	SSIPZ05	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby	
Area Subtotal								27	3	3		
TR-3 and Parking Lot R	B001-01	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	B001-02	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	B001-03	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	B001-04	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	B001-05	Upper	1	NO	Piezometer, no sample history	NO	NO	x			LNAPL nearby, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	B001-06	Upper	1	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	B001-07	Upper	1	NO	Piezometer, no sample history	NO	NO	x			Evaluate mounding in A&R area, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	B001-08	Upper	1	NO	Piezometer, no sample history	NO	NO	x			Evaluate mounding in A&R area, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	B001-09	Upper	1	NO	Piezometer, no sample history	NO	NO	x			Evaluate mounding in A&R area, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	B001-10	Upper	1	NO	Piezometer, no sample history	NO	NO	x			Evaluate mounding in A&R area, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	MW-18	Upper	2	NO	YES	NO	YES	x	x		Long monitoring history, evaluate trends, evaluate horizontal well capture zone	Long analytical history, evaluate trends
TR-3 and Parking Lot R	MW-20	Upper	2	YES	Not Sampled, LNAPL Present	NO	YES	x			Historical presence of LNAPL, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	MW-41D	Lower	2	NO	NO	NO	NO	x			Lower well, evaluate horizontal well capture zone zone	
TR-3 and Parking Lot R	MW-43	Upper	2	NO	NO	NO	NO	x			Spatial distribution, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	MW-44	Upper	2	NO	YES	YES	NO	x	x	x	Spatial distribution, evaluate horizontal well capture zone	Historical detection of PCBs
TR-3 and Parking Lot R	MW-45	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, evaluate horizontal well capture zone	Spatial distribution, upgradient of TR-3
TR-3 and Parking Lot R	MW-46	Upper	2	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	MW-47	Upper	2	NO	NO	NO	NO	x			Spatial distribution, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	MW-48	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, evaluate conditions in SWTP area	Historical VOC presence
TR-3 and Parking Lot R	MW-50	Upper	2	NO	NO	NO	NO	x	x		Evaluate changed conditions due to sheet pile wall	Evaluate changed conditions due to sheet pile wall
TR-3 and Parking Lot R	MW-51	Upper	4	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-52	Upper	4	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-53	Upper	2	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-54	Upper	4	NO	NO	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-54D	Lower	2	NO	NO	NO	NO				Excluded - Artesian	
TR-3 and Parking Lot R	MW-55	Upper	2	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-56	Upper	2	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-57	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, evaluate horizontal well capture zone	Evaluate changed conditions due to sheet pile wall
TR-3 and Parking Lot R	MW-58	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, evaluate downgradient of sheet pile wall	Historical elevated VOCs north of barrier wall, evaluation of remedy
TR-3 and Parking Lot R	MW-60	Upper	2	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-61	Upper	2	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-62	Upper	2	NO	NO	NO	NO	x			Spatial distribution, evaluate horizontal well capture zone	

APPENDIX B
UTC/CARRIER
SITE-WIDE GROUNDWATER MONITORING PROGRAM RATIONALE

Area	Monitoring Well/ Piezometer	Water-bearing Zone (Upper/ Lower)	Well Diameter (inches)	Historical LNAPL (Y/N)	Exceedance of VOC Criteria Last Time Sampled?	Historical PCB Detection?	Consent Order Well (Y/N)	Proposed Wells For:			Rationale for Inclusion or Exclusion- Water Levels	Rationale for Inclusion- Sampling
								Water Levels	Sampling			
									VOCs	PCBs		
TR-3 and Parking Lot R	MW-66	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, evaluate downgradient of sheet pile wall	Historical elevated VOCs north of barrier wall, evaluation of remedy
TR-3 and Parking Lot R	MW-67	Upper	2	NO	NO	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	MW-68	Upper	2	NO	NO	NO	NO	x			Spatial distribution, evaluate downgradient of sheet pile wall	
TR-3 and Parking Lot R	PLR001	Upper	1	YES	Not Sampled, LNAPL Present	NO	NO	x			Historical presence of LNAPL, evaluate horizontal well capture zone	
TR-3 and Parking Lot R	PLR002	Upper	1	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	PLR056	Upper	1	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	PLR057	Upper	1	NO	NO	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	PLR058	Upper	1	NO	YES	YES	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	PLR060	Upper	1	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	PLR061	Upper	1	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
TR-3 and Parking Lot R	TR3-GB-03	Lower	2	NO	NO	NO	NO				Excluded - Artesian	
TR-3 and Parking Lot R	TR3-PW-01	Upper	4	NO	YES	NO	NO	x	x		Spatial distribution, evaluate horizontal well capture zone	Spatial distribution, evaluate impact of sheet pile wall on groundwater concentrations, highest VOC concentrations in area
TR-3 and Parking Lot R	TR3-PW-02	Upper	4	NO	NO	NO	NO	x			Spatial distribution, evaluate horizontal well capture zone	
Area Subtotal								26	9	1		
SWMU 1-4	MW-03D	Lower	2	NO	YES	NO	YES	x	x		Lower well	Lower well with historical groundwater exceedances
SWMU 1-4	MW-03S	Upper	2	NO	YES	NO	YES	x	x		Only Upper well in area	Only Upper well in area
SWMU 1-4	MW-13D2	Lower	2	NO	NO	NO	YES	x			Lower well	
SWMU 1-4	MW-22D	Lower	2	NO	YES	NO	YES	x			Lower well	
Area Subtotal								4	2	0		
Remaining	B001-11	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	B001-12	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	B001-13	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	B001-14	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	B001-15	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	B001-16	Upper	1	NO	Piezometer, no sample history	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	DP-MW-01	Upper	2	NO	NO	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	DP-MW-02	Upper	2	NO	YES	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	DP-MW-03	Upper	2	NO	NO	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	DP-MW-05	Upper	2	NO	NO	NO	NO				Excluded - Sufficient coverage of this area	
Remaining	MW-08	Upper	2	NO	NO	NO	YES	x			Spatial distribution, central	
Remaining	MW-49	Upper	2	NO	NO	NO	NO	x			Spatial distribution, north central, east of TR-2	
Remaining	MW-69	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, central	Spatial distribution, central
Remaining	MW-70	Upper	2	NO	NO	NO	NO	x	x		Spatial distribution, TR-2 area	Spatial distribution, to represent TR-2 area groundwater
Remaining	MW-72	Upper	2	NO	NO	NO	NO	x			Spatial distribution, southwest	
Remaining	MW-74	Upper	2	NO	NO	NO	NO	x			Spatial distribution, central	
Remaining	MW-75	Upper	2	NO	NO	NO	NO	x	x		Spatial distribution, central	Spatial distribution, central
Remaining	MW-78	Upper	2	NO	NO	NO	NO	x			Spatial distribution, northeast	
Remaining	MW-81	Upper	2	NO	NO	NO	NO	x			Spatial distribution, evaluate mounding in A&R area	
Remaining	MW-82	Upper	2	NO	NO	NO	NO	x			Spatial distribution, evaluate mounding in A&R area	
Remaining	MW-83	Upper	2	NO	NO	NO	NO	x			Spatial distribution, evaluate mounding in A&R area	
Remaining	MW-84	Upper	2	NO	YES	NO	NO	x	x		Spatial distribution, central	Spatial distribution, central
Area Subtotal								12	4	0		
Total:								94	32	5		

Notes:
A&R - Administration and Research
LNAPL - Light Non-Aqueous Phase Liquid
PCBs - Polychlorinated biphenyls
SWMU - Solid Waste Management Unit
VOCs - Volatile Organic Compounds

AECOM
257 West Genesee Street
Buffalo
NY, 14202
USA
aecom.com