AECOM

Prepared For:
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Shared Remediation Services
Farmington, CT

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July 2016

TR-3 NORTH WALL / SWTP AREA
UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY

IRM Pre-Design Investigation Report

Corrective Action Order - Index CO 7-20051118-4

NYSDEC Site Registry #734043

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Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

1.1 Site Description

This report presents findings of an investigation at the TR-3 North Wall/Stormwater Treatment Plant (SWTP) Area at the United Technologies Corporation (UTC)/Carrier facility on Thompson Road in Syracuse, Onondaga County, New York (See **Figure 1**). Historical information provided by site personnel indicates that the former TR-3 building was originally constructed in the early 1950s with two later additions. The building was used to manufacture various air conditioner components. These former manufacturing operations included the use of electrical transformers and various oils (e.g., hydraulic, compressor) which potentially contained polychlorinated biphenyls (PCBs). The former TR-3 building also contained a degreaser that used the chlorinated solvent trichloroethene (TCE).

The SWTP was constructed in the early 1990s at the northeast corner of the TR-3 building. The TR-3 building was demolished in 2010/2011. Following demolition, the floor slab and north wall of the building were left in place. The remaining portion of the wall acts as a retaining wall to accommodate the approximate 7-foot (ft) elevation drop from the south to the north side of the wall. Currently, the former TR-3 building area is used for green space, Parking Lot R, and the SWTP.

The *Former Building TR-3 North Wall Investigation Report*, prepared by EnSafe, Inc. (EnSafe), was submitted to the NYSDEC in February 2015. Findings from the EnSafe investigation confirmed the presence of chlorinated volatile organic compounds (VOCs), PCBs, and petroleum oil-related impacts in shallow subsurface soils and groundwater in the TR-3 North Wall area, including the area between the wall and Sanders Creek.

1.2 Purpose of Investigation

A Proposed Interim Remedial Measure (IRM) and IRM Predesign Investigation (PDI) Sampling and Analysis Plan (SAP), was submitted to the New York State Department of Environmental Conservation (NYSDEC) in December 2015, incorporating comments from the NYSDEC December 3, 2016 approval letter. The conceptual IRM design consists of sheet wall installation, groundwater extraction and treatment, and impacted soil removal. The sheet pile wall will function as a hydraulic barrier for containment and extraction of impacted groundwater. The SAP outlined the proposed PDI activities required to complete the design. The specific objectives of the PDI included:

- Locating utilities adjacent to TR-3 North Wall and SWTP;
- Advancing geotechnical borings along the proposed sheet pile wall alignment;
- Conducting pumping and slug tests to evaluate hydrogeologic conditions in the shallow and deep water-bearing units;
- Installing monitoring wells on the north side of Sanders Creek to investigate the presence/absence of groundwater impacts;
- Sampling for delineation of impacted soil in the immediate vicinity of the TR-3 North Wall and SWTP;
- Sampling groundwater for characterization;
- Identifying the number and locations of weep holes in the TR-3 North Wall; and
- Characterizing investigation-derived waste (IDW) for disposal requirements.

This report was prepared to summarize the results of the PDI.

2.0 Site History

This section provides a description of the site and the historical investigations and remedial actions performed at the TR-3 North Wall and the nearby area.

2.1 Site Description

The TR-3 North Wall/SWTP area is located in the north central portion of the UTC Thompson Road Campus (**Figure 1**). The area is bounded on the north by Carrier Parkway (Route 298) and New York State Department of Transportation right-of-way, and UTC property to the east, south, and west. Sanders Creek, which flows east to west, lies in the area between Route 298 and the TR-3 North Wall/SWTP.

The ground surface south of the TR-3 North Wall is approximately 7 ft higher than the north side of the wall. The area south of the North Wall is relatively flat. North of the wall the topography drops 7 to 8 ft, in varying slope, down to Sanders Creek (see **Figure 2**). The former TR-3 building was previously demolished with the exception of the north wall and floor slab. Following demolition, approximately 1 to 2 ft of clean fill was placed over the former building footprint. Weep holes were drilled into the TR-3 North Wall to drain surface water that accumulates behind the wall.

The SWTP, located in the northeastern portion of the area, is the only building present in the former TR-3 area.

2.2 History and Operation

The TR-3 building was built in the early 1950s for the manufacture of various air conditioner components. The first addition was constructed in the late 1950s and the second addition was constructed in the 1970s. Oils used in the air conditioner manufacturing operation included transformer oil, machining oil, lubricating oil, hydraulic oil, compressor oil, and degreasers. Some of the oils are suspected to have contained PCBs. The degreasers contained TCE.

Part of the TR-3 building included a transfer line, referred to as the “T-Line”, which was located along the north wall of former TR-3 building, immediately west of the current SWTP. The former T-Line was comprised of 58 machining stations, each of which utilized a lubricating oil bath. Located adjacent and connected to the T-Line was an approximately 500-gallon tank that supplied filtered oil to the machining stations.

In 2000, during limited excavation prior to building demolition, Carrier excavated oil-impacted soils adjacent to and beneath the building’s northern exterior wall. The excavation extended beneath the former TR-3 building slab and resulted in the removal of approximately 20 cubic yards of impacted soil. The excavation was limited, because of a concern for the structural integrity of the building.

2.3 Interim Measures at Outfall 001

In 2003, an IRM was completed at the outfall historically designated 011, which is located north of the SWTP. At one point, this outfall was also designated as 007, but is now designated as 001, and serves as the SWTP outfall (see **Figure 2)**. The purpose of the IRM was to prevent the migration of impacted groundwater (via outfall bedding) into Sanders Creek. The IRM included the installation of a foam wall barrier encapsulating the outfall 001 pipe and bedding, and extending out perpendicular from the pipe. The wall was constructed by placing a series of 1-inch diameter steel injection tubes

into the granular bedding material and then injecting a polyurethane grout into the bedding material through tubes. The polyurethane grout reacts with water and forms a rigid foam. This foam barrier was installed around a pipe section located between the SWTP and Sanders Creek. The IRM also included installation and operation of a groundwater recovery well in the granular bedding material of the SWTP outfall.

2.4 Previous Investigations

Previous assessments that focused on various areas of the former TR-3 building include:

- An investigation of the TR-3 degreaser in the southeast corner of the former TR-3 building;
- An investigation of the storm water detention pond (Pond 3) located outside the northwest corner of TR-3;
- An investigation of the storm sewer utility lines associated with the former TR-3 building in the central portion of what is now Parking Lot R;
- Expansion of previous assessments including a Parking Lot R investigation conducted in October and November 2013;
- Manhole 3 (MH3) oil source investigation; and
- Former Building TR-3 North Wall Investigation.

The previous EnSafe investigation performed regarding the source of oil observed in Manhole 3 (located in the SWTP) identified limited quantities of oil along the southern and westerns walls of the SWTP and the south side of the TR-3 North Wall. A subsequent investigation was then performed in 2014 to investigate the subsurface extent of VOCs, PCBs, and oils along the TR-3 North Wall. EnSafe's *Former Building TR-3 North Wall Investigation Report* was submitted to the NYSDEC in February 2015. Findings indicated chlorinated VOCs, PCBs, and petroleum oil-related impacts to subsurface soils and groundwater in the area, including the area between the TR-3 North Wall and Sanders Creek.

The key findings were:

- Impacts to soil and groundwater are vertically limited to the shallow zone above a clay aquitard located at approximately 20 ft below the former TR-3 building slab;
- Artesian conditions exist in the lower aquifer; and
- Impacted groundwater has the potential to migrate to Sanders Creek, both from potentially impacted soil north (downgradient) of the TR-3 North Wall, and by continuing flow from the potential source area behind the wall (south).

The report also recommended additional investigation and sampling to the north of Sanders Creek to determine if impacted groundwater migrated northward, beneath Sanders Creek.

The investigation included the installation of eight monitoring wells (MW-54D, MW-56, MW-57, MW-58, MW-59, MW-66, MW-67, and MW-68) between the TR-3 North Wall and Sanders Creek. Soil samples from each well boring were generally submitted for analysis of PCBs, VOCs, and Oil Range Organics and Diesel Range Organics (ORO and DRO, are collectively referred to as total petroleum hydrocarbons [TPH]). Results are summarized below:

- No VOC samples were submitted for analysis from borings MW-54D or MW-68.
- Of the nine samples submitted for PCB analysis, one sample exceeded for Title 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 Unrestricted Use soil cleanup criteria for PCBs.

- Of the six samples submitted for VOC analysis, four exceeded Unrestricted Use criteria for VOCs, however, three of the four exceeded for acetone only.
- Only one of the eight sample locations, MW-57 (adjacent to the north side of TR-3 North Wall), exhibited elevated detections (>100 milligrams per kilogram [mg/kg]) for TPH (Part 375 does not have cleanup criteria specific to TPH).

3.0 Current Field Investigation Activities

The current field investigation of the TR-3 North Wall area took place in two phases. The first was performed in January 2016 and the second was in April/May 2016. The field activities included borehole pre-clearance, drilling and installation of new groundwater monitoring wells, advancement of soil borings, pumping and slug tests, community air monitoring, equipment decontamination, IDW management, collection and analysis of soil and groundwater samples, and survey of investigation point locations and elevations.

Filed investigation activities were performed in accordance with the SAP and the Quality Assurance Project Plan (QAPP).

Prior to commencement of intrusive sampling activities, Dig Safely NY was notified for utility clearance. A geophysical contractor conducted a survey around each boring area using ground penetrating radar (GPR) equipped with a 400mHz antenna and a Radiodetection RD7000 cable and pipe locator instrument. The geophysical survey was also used to locate buried utilities on the north side of the TR-3 North Wall. Facility personnel also assisted in the assessment of buried utilities in the investigation areas. The locations of the utilities are shown in **Figure 2.**

Prior to drilling, each location was pre-cleared to a depth of approximately 5 ft by the drilling subcontractor using hand tools. IDW, including drill cuttings, development water, purge water, decontamination water, and sampling tubing, were drummed, labeled, and stored on-site pending analyses for appropriate disposal.

The field investigation included the collection and analysis of soil and groundwater samples. Analytical parameters included VOCs and PCBs. **Table 1** presents the number of samples collected per media (i.e., soil and groundwater) as well as quality assurance/quality control (QA/QC) samples. **Table 2** provides a summary of the analytical methods, as well as bottle, preservation, and holding time requirements.

An inspection of the TR-3 North Wall identified the presence of 36 equally spaced weep holes, approximately 1-inch in diameter and 5 ft above the ground surface on the north side of the wall. The inspection confirmed that the weep holes are located above the concrete slab (the former building floor) on the south side of the wall.

3.1 Drilling and Soil Sampling

Drilling services were provided by Parratt-Wolff, Inc. Track-mounted drill rigs were used in the area north of the TR-3 North Wall where the terrain is steep. A truck-mounted drill rig was used in accessible areas where the terrain was relatively flat (i.e., just north of the TR-3 North Wall and the area south of the TR-3 North Wall). The actual boring locations were adjusted in the field based on the presence of underground utilities and accessibility of the drilling equipment.

Borings were advanced for the following purposes:

- Installation of two monitoring wells;
- Installation of two pumping wells;
- Delineation of soil impacts (11 borings); and
- To obtain geotechnical information for sheet pile wall design (five borings).

The following nomenclature was used for the final borings and wells:

- Monitoring wells were designated TR3-MW-01 and TR3-MW-02;
- Pumping wells were designated TR3-PW-01 and TR3-PW-02;
- Delineation soil borings were designated as TR-3-SB-01 through TR3-SB-11; and
- Geotechnical borings were designated as TR3-GB-01 through TR3-GB-05.

Ten delineation borings were originally proposed. However, solvent orders and elevated volatile organic vapor readings were measured with the photoionization detector (PID) while drilling boring TR3-GB-01, located just north of the SWTP. Boring TR3-SB-11 was added to characterize soil contaminant conditions east of TR3-GB-01.

All borings were continuously sampled, using either direct-push or split-spoon sampling techniques. Borings advanced to obtain geotechnical information for sheet pile design and well installation were advanced while continuously collecting soil samples using a 1 $^{3}/_{8}$-in inside diameter by 2-ft long split-spoon sampler in general accordance with ASTM D1586. Undisturbed Shelby Tube samples were collected from select geotechnical boring intervals in general accordance with ASTM D1587.

Borings for delineation of soil impacts were advanced using direct-push technology and were continuously sampled using the Geoprobe Dual Tube (DT22 Liner) System.

For both sampling methods, each soil sample was inspected for evidence of contamination (e.g., staining and odors) and screened for volatile organic vapors using a calibrated miniRae photoionization detector (PID) equipped with a 10.6 eV lamp.

Generally, three soil samples were collected from each boring to bracket the vertical extent of apparent soil impacts: one soil sample collected from the interval above the interval of greatest observable impacts, one from the interval of greatest observable impacts, and one from the interval below the greatest observable impacts. If no apparent impacts were identified, three samples were collected to confirm the absence of contamination: one sample collected from the unsaturated zone, one from the interval of groundwater fluctuation, and one from the saturated zone.

Field observations were recorded in a dedicated, bound log book. Copies of boring logs prepared by the supervising AECOM geologist, are presented in **Appendix A**. Investigation locations are shown on **Figure 3**.

For each sampling interval, soil for VOC analysis was collected using TerraCore® samplers. For the remaining analytical parameters, the soil was homogenized and then transferred into the appropriate laboratory-provided sample containers.

Soil samples for geotechnical analyses of grain size were placed in glass jars provided by the driller. Shelby Tube samples were sealed in the field with wax, plastic caps, and tape immediately after collection.

3.2 Well Installation

Wells were installed for two primary purposes: to monitor groundwater levels and quality, and for characterization of hydrogeologic conditions through pumping tests. Well construction information is included in the boring logs provided in **Appendix A** and summarized in **Table 3**.

3.2.1 Pumping Test Well Construction

Pumping test wells TR3-PW-01 and TR3-PW-02 were installed in the upper water-bearing zone on the south side of the TR-3 North Wall. The borings were advanced to depths of 28 ft using a truck-mounted rig with 6 ¼-in inside diameter hollow stem augers (HSAs).

The pumping test wells were constructed with 10-slot, 4-in diameter flush-coupled polyvinyl chloride (PVC) screen and solid riser. Groundwater was observed at depths of 16.5 and ft 10.0 below ground surface (bgs), in TR3-PW-01 and TR3-PW-02, respectively. Well TR3-PW-01 was screened from 13 to 28 ft bgs and well TR3-PW-02 was screened from 11 to 16 ft bgs. A NJ #0 sand filter was placed in the annular space between the well screen/riser and the borehole wall and extended from the bottom of the well screen to approximately 2 ft above the top of the screen. Bentonite was placed above the sand filter. The sand filter and bentonite were added through the augers as the augers were slowly removed. Each well was completed with a flush-mount casing set in concrete.

3.2.2 Shallow Monitoring Well Construction

Monitoring wells TR3-MW-01 and TR3-MW-02 were installed in the upper water-bearing zone to monitor groundwater conditions on the north side of Sanders Creek. The borings were advanced to depths of 8 and 16 ft, respectively, using a track-mounted Geoprobe rig with 4 ¼-in inside diameter HSAs.

The monitoring wells were constructed with 10-slot, 2-in diameter flush-coupled PVC screen and solid riser. Groundwater was observed at depths of 3.0 and 4.0 ft bgs in TR3-MW-01 and TR3-MW-02, respectively. The wells were screened from 2 to 8 ft bgs and 2 to 12 ft bgs, respectively. A NJ #0 sand filter was placed in the annular space between the well screen/riser and borehole wall and extended from the bottom of the well screen to approximately 0.5 ft above the top of the screen. Bentonite was placed above the sand filter. The sand filter and bentonite were added through the augers as the augers were slowly removed. Each well was completed with a flush-mount casing set in concrete.

3.2.3 Deep Monitoring Well Construction

Monitoring well TR3-GB-03 was installed on the north side of the TR-3 North Wall. The boring was advanced to a depth of 50 ft using a truck-mounted rig. The upper 19 ft of the boring was advanced using 6 ¼-in inside diameter HSAs. A 4-in diameter steel separation casing was then grouted in place. Once the grout had properly cured (approximately 48 hours later), the remainder of the boring was advanced using mud rotary drilling. The drilling mud was contained and placed in 55-gallon drums for subsequent offsite disposal.

The intent of this deep well is to monitor the confined water-bearing zone. Once the drilling mud was flushed from the borehole, the well began to flow under artesian conditions. A temporary 10-ft PVC stick-up casing was added to the well to facilitate well construction. The monitoring well was constructed with 10-slot, 2-in diameter flush-coupled PVC screen with a solid riser. The well was screened from 34 to 50 ft bgs. A NJ #0 sand filter was placed in the boring around the annulus space extending from the bottom of the well screen to approximately 2 ft above the top of the screen. A bentonite seal was placed above the sand filter from 32 to 27 ft bgs. Cement bentonite grout was placed above the bentonite using 1-in tremie pipe. After the grout had time to cure, the temporary stick-up was removed and a downhole plug was installed in the well to a depth of approximately 5 ft bgs to prevent damage to the well during freezing temperatures. The well was completed with a flush-mount casing set in concrete.

3.2.4 Geotechnical Borings

Borings TR3-GB-01 through TR3-GB-05 were advanced along the north side of the TR-3 North Wall to collect geotechnical information to facilitate design of a sheet pile wall. The borings were advanced using a truck-mounted rig with 6 ¼-in inside diameter HSAs. Soil samples were collected using split-spoons and Shelby tubes.

The borings were initially advanced to a depth of 19 to 21 ft. A 4-in diameter steel separation casing was then set in grout to depths ranging from 19 to 20 ft bgs. With the exception of TR3-GB-01, after the grout cured the borings were advanced using mud rotary drilling while continuously collecting split spoon and/or Shelby tube samples to a depth of approximately 50 ft bgs. Boring TR3-GB-01 was not advanced below 20 ft because of contamination observed in the shallower soils and concern of creating a conduit for downward contaminant migration.

With the exception of TR3-GB-01 and TR3-GB-03, the borings were grouted upon completion using a cement/bentonite slurry. Boring TR3-GB-01 was not grouted, but a locking cap was installed on the steel separation casing. As mentioned above, TR3-GB-03 was completed as a deep monitoring well.

Eighteen samples were collected from these five borings for geotechnical analyses. Five of the 18 samples were Shelby tube samples collected from the confining clay layer. These samples were submitted for analysis of Atterberg Limits, water content, and unconsolidated-undrained triaxial testing by ASTM Methods D4318, D2216, and D2850, respectively. Thirteen soil samples from the sand unit beneath the clay were selected for grain size analyses using ASTM Method D422. A copy of the geotechnical lab report is provided in **Appendix B.**

3.2.5 Delineation Borings

Eleven contamination delineation borings, TR3-SB-01 through TR3-SB-11, were advanced in the area between the TR-3 North Wall and Sanders Creek using a track-mounted Geoprobe Rig. Soil sampling was performed using a 4-ft long acetate-lined sampler. Depths ranged from 4.5 to 16 ft bgs. Boring TR3-SB-05 was not completed to the planned depth of 16 ft due to shallow refusal on concrete at 4.5 ft bgs. Boring TR3-SB-06 was not completed to the planned depth due to uneven terrain, which made drilling unsafe. Only hand clearing to 4.5 and 5.0 ft bgs, respectively, was completed at these two borings. All the delineation borings were backfilled with bentonite chips upon completion.

3.3 Well Development

The monitoring wells were developed on April 12 and 13, 2016 by surging and pumping. The artesian well, TR3-GB-03, was allowed to self-purge at a flow rate of approximately 3 to 5 gallons per minute until a volume of approximately 45 gallons was removed from the well. Water quality measurements of pH, conductivity, temperature, and turbidity were periodically recorded during the development process. Copies of well development logs are provided in **Appendix C**.

3.4 Groundwater Sampling

On April 18 and 19, 2016, groundwater samples were collected from the new wells using the low-flow purge technique. The artesian well was sampled by installing a temporary riser and sampling tee. A low flow rate was maintained through the use of a gate valve on the sampling tee. Three well volumes were purged prior to sampling.

Water quality measurements of pH, conductivity, dissolved-oxygen, oxidation-reduction potential, temperature, and turbidity were frequently recorded during the purging process. Groundwater quality measurements were documented on AECOM purge logs which are provided in **Appendix D**.

The groundwater samples were analyzed for VOCs, and total and filtered PCBs. The samples for filtered PCB analyses were passed through a 0.45-micron inline filter.

3.5 Surveying

The soil boring and monitoring well locations were surveyed for location and elevation by a licensed AECOM land surveyor. Locations and elevations were measured to 0.01 ft. Location measurements were referenced to New York State Plane Central Zone North American Datum of 1983 (NAD 83) and elevations were referenced to North American Vertical Datum of 1988 (NAVD 88). Survey information is provided in **Table 3**.

3.6 Analytical Program

Soil and groundwater samples for laboratory chemical analyses were placed in pre-cleaned, laboratory-supplied glass jars, labeled, packed in a cooler with ice, and transported via courier to Accutest Laboratories under standard chain of custody procedures. The samples were submitted for analytical testing for the parameters listed in **Table 1** under standard turnaround time. Category B deliverable packages were requested for all sample delivery groups.

Samples for geotechnical analysis were hand delivered by AECOM to 3rd Rock, LLC, of East Aurora, NY.

3.7 Pumping Tests

Pumping tests were conducted using the two new 4-inch diameter unconfined water-bearing zone wells (TR3-PW-1 and TR3-PW-2), two existing 2-inch diameter unconfined water-bearing zone monitoring wells (MW-50 and MW-62), and existing confined water-bearing zone well MW-54D.

The pumping tests were performed using a Grundfos Redi-flo 2 submersible pump and In-Situ Level TROLL 700 pressure transducers to monitor water levels in the pumping well and in nearby monitoring wells.

During the tests, the water level was periodically monitored in Sanders Creek at surveyed measuring points immediately upstream and downstream of the TR-3 area.

3.7.1 Unconfined Water-Bearing Zone Pumping Tests

The tests at TR3-PW-2, MW-50, and MW-62 were conducted for approximately 7 hours with 2 hours recovery at the end of pumping. Pumping at TR3-PW-1 was terminated after 2 hours because the very low flow rate required for sustained yield could not be maintained by the pump. Water recovered during the pumping tests was conveyed to the SWTP for treatment. An abbreviated summary of pumping test details is summarized below:

Pumping Well	Observation Wells	Flow Rate (GPM)
TR3-PW-1	MW-43, MW-55, MW-56, and MW-61	Started at 0.5, reduced to 0.14
TR3-PW-2	MW-50, MW-58, MW-68, and MW-67	0.50
MW-50	TR3-PW-2, MW-58, MW-67, and MW-68	3.08
MW-62	TR3-PW-1, MW-43, MW-47, and MW-61	0.08-0.11

In addition, rising and falling head slug tests were performed on these wells to determine hydraulic conductivity and supplement the pumping test data.

3.7.2 Confined Water-Bearing Zone Pumping Test

A pumping test was performed using existing deep well MW-54D. Pressure transducers were installed to monitor water levels in the pumping well, the newly-installed nearby deep well (TR3-GB-03), and in existing deep well MW-14D. Because of artesian conditions, temporary extensions were installed on the deep well risers during the pumping test.

Also, during the deep well pumping test, nearby shallow monitoring wells MW-53 and MW-55 were monitored with pressure transducers to determine the degree of hydraulic connection, if any, between the unconfined and confined water-bearing zones.

The deep well pumping test was conducted for a total of 6 hours with 2 hours recovery at the end of pumping. The flowrate was approximately 3.2 GPM throughout the test. Water recovered during the pumping test was conveyed to the SWTP for treatment.

4.0 Investigation Results

This report section provides a summary of field screening, laboratory analytical results, and hydrogeologic evaluations.

4.1 Field Screening Results

4.1.1 Soil Observations

Wells TR3-PW-01 and TR3-PW-02 were installed on the south side of the TR-3 North Wall. Both wells were advanced to a depth of 28 ft. Drilling observations indicated that 1.8 to 2.8 ft of fill consisting of clayey silt, with trace gravel, overlies the approximately 1.5-ft thick former building concrete floor slab. The slab is underlain by interbedded sand, clay, and silt to a depth of approximately 24 to 26 ft bgs. The confining gray clay unit was encountered at this depth. Saturated conditions were encountered at 16.5 ft and 10 ft bgs in well TR3-PW-1 and TR3-PW-02, respectively.

As shown in **Figure 2**, the topography north of the TR-3 North Wall drops off towards Sanders Creek, with an approximate 7-ft drop from ground surface immediately adjacent to the wall down to the creek level. Observations made during drilling the locations on the north side of the TR-3 North Wall show that the area generally consists of topsoil underlain by as much as 14 ft of fill. The fill is underlain by an interbedded clayey silt to silty clay unit with some sand to a depth of approximately 18 ft bgs. The gray clay confining unit underlies this unit and ranges in thickness from 7 to 13 ft. The gray clay is underlain by several feet of clayey silt to silt, which is underlain by a red brown fine to medium sand unit that is approximately 2 to 6 ft thick. Below that is a dense clay/silt unit, likely a lodgment till, ranging from 4 to 12 ft thick. Red brown to green gray weathered shale underlies this unit. Geologic cross sections of the area are shown in **Figure 4**. **Figure 5** presents the line of cross section location map.

The depth to groundwater observed during drilling ranged from as shallow as 2 ft bgs, near Sanders Creek, to 16.5 ft bgs in the area south of the TR-3 North Wall.

Elevated PID readings and solvent odors were observed in TR3-GB-01 at a depth of approximately 16 ft bgs. A single droplet of non-aqueous phase liquid (NAPL) was observed on the outside of the soil sample core in the 18- to 20-ft interval. The presence of solvent odors, elevated PID readings, and the droplet may indicate the presence of solvent in the form of dense non-aqueous phase liquid (DNAPL) in this area. Slightly elevated PID readings but no odors were observed at TR3-GB-02, TR3-PW-01, TR3-SB-01, TR3-SB-02, and TR3-SB-07.

Table 4 presents a summary of observations made during drilling.

4.1.2 Groundwater Observations

Water levels were recorded at the five newly installed wells prior to sampling on April 18, 2016. The data is included on **Table 3**. In the area south of the TR-3 North Wall, the depth to groundwater was 12.18 ft bgs in TR3-PW-01 and 11.35 ft bgs in TR3-PW-02. North of Sanders Creek, the depth to groundwater in the wells TR3-MW-01 and TR3-MW-02 was approximately 0.91 ft bgs and 2.08 ft bgs, respectively. These wells are approximately 10 ft lower in elevation than the pumping test wells located south of the TR-3 North Wall.

The water level at deep well TR3-GB-03 was recorded as 7.65 ft above ground surface indicating an upward hydraulic head from the deep to the shallow water-bearing zone.

Based on EnSafe's *Former Building TR-3 North Wall Investigation Report* and the *Corrective Measures Update Site-wide Groundwater Monitoring Report, June 2015*, the anticipated flow direction from both the south and north sides of Sanders Creek is toward Sanders Creek. Because there were only four shallow wells installed during this investigation, and these wells have not been measured contemporaneously with the side-wide groundwater monitoring network, a ground water contour map was not generated specific to this investigation.

4.2 Chemical Analytical Results

The chemical analytical results for soil and groundwater samples were validated by an AECOM chemist following NYSDEC DER-10 and USEPA Region II data validation procedures. The validated data is provided in a data usability summary report (DUSR).

The DUSR presents deviations from the relevant QC requirements and the associated qualifications to the sample data warranted by these deviations. QC issues discussed in detail in the DUSR include surrogate sample recoveries, matrix spike recoveries, duplicate sample analyses, instrument calibration and performance and method and field blank sample analyses. The report also presents copies of the laboratory reporting forms with hand written qualifications made by the data reviewer. The data presented in the summary tables included in this report reflect these qualifications.

A copy of the DUSR narrative is provided in **Appendix E**. A copy of the DUSR appendices (e.g., Form 1s), is available on request.

4.2.1 Applicable Standards, Criteria, and Guidance

Soil PCB and VOC results were compared to Part 375 Soil Cleanup Objectives (SCOs) for:

- Protection of Public Health (Residential, and Industrial);
- Protection of Ecological Resources; and
- Protection of Groundwater.

The groundwater analytical results are compared to the NYS Ambient Water Quality Standards (AWQS) and Guidance Values in Technical & Operational Guidance Series (TOGS) Version 1.1.1., June 1998, with June 2004 Addendum.

4.2.2 Soil Results

A total of 53 soil samples and two duplicate samples were collected from 18 borings and submitted to the laboratory for chemical analysis. There were no samples collected from borings TR3-SB-05 and TR3-SB-06 because those borings were terminated at shallow depths (4.5 ft. and 5 ft., respectively).

VOC Soil Analytical Results

Review of the VOC soil analytical results indicates the following:

- VOC results were compared to each of the four criteria and Protection of the Groundwater SCO resulted in the greatest number of exceedances. while comparison to Protection of Public Health, Industrial Use resulted in the smallest number of exceedances.

- Thirty two samples contained VOCs at concentrations above the Protection of Groundwater criteria. VOCs exceeding the criteria were cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), acetone, tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride.
- Only one sample contained VOCs at a concentration above the Industrial Use criteria (TCE in TR3-GB-01).
- The highest concentrations of VOCs were detected in seven borings (TR3-GB-01, TR3-GB-02, TR3-PW-01, TR3-SB-01, TR3-SB-02, TR3-SB-04, and TR3-SB-07).
- The samples from TR3-PW-02, TR3-MW-01, and TR3-MW-02 did not contain any VOCs at concentrations above either criterion.
- Acetone was detected in 16 samples with 11 of those samples containing acetone at concentrations above the Protection of Groundwater criteria. In four samples, it was the only VOC detected at concentrations above the Protection of Groundwater criteria.

It is noted that acetone is not included in Figures 6 and 7. Acetone is not believed to be a site contaminant related to past operations. Acetone is a common laboratory contaminant. Also, a 2010 report "*Acetone Production as a Result of Sodium Bisulfate Preservation of Soil Samples*" by J.L. Clausen et al. suggests that certain chemical interactions with naturally occurring organic matter can cause the formation of acetone.

The analytical results are presented in **Table 5. Figure 6** compares the results to Protection of Groundwater criteria. **Figure 7** compares the results to Industrial Use criteria**.**

PCB Soil Analytical Results

The highest detection of total PCBs was 0.442 mg/kg in TR3-SB-03. This does not exceed the restricted SCOs of Protection of Public Health; Protection of Ecological Resources; or Protection of Groundwater. However, it does exceed the Unrestricted Use Soil Cleanup Objective of 0.1 mg/kg.

4.2.3 Groundwater Results

Groundwater samples were collected from the five new wells in the TR3 North Wall area. The samples were analyzed for VOCs and total and dissolved PCBs. The analytical results are presented in **Table 6** and **Figure 8**. Only well TR3-PW-01 contained compounds at concentrations above the groundwater criteria including 1,1-dichloroethene (1,1-DCE), cis-1,2-DCE , trans-1,2-DCE, PCE, TCE, and vinyl chloride.

No PCBs were detected in groundwater in any of the five wells.

4.3 Estimated Areal Extent of Impacted Soil North of TR-3 North Wall

One of the purposes of the investigation was to delineate the extent of soils requiring remediation on the from the north side of the TR-3 North Wall to the edge of Sanders Creek. **Figures 6** and **7** compare the soil analytical results to Protection of Groundwater and Industrial Use criteria, respectively. Soil analytical results for MW-54D, MW-56, MW-57, MW-58, MW-59, MW-66, MW-67, and MW-68 from EnSafe's previous investigation are also shown on the figures. The results show apparently discontinuous areas of elevated chlorinated VOC contamination in the following areas:

- From TR3-SB-04 to TR3-SB-01 and TR3-SB-11.
- From MW-66 to TR3-SB-07.

The soil analytical results suggest that the greatest levels of contamination occur at or just above the confining gray clay unit. The results suggest that groundwater and/or DNAPL was the primary source of soil contamination and, where impacted groundwater is present, the soils are also impacted.

Because borings TR3-SB-05 and TR3-SB-06 could not be completed as planned, limited soil data exists for the area between TR3-07 and TR3-SB-04. However, groundwater data from EnSafe's 2015 site wide sampling effort shows VOC impacts in monitoring wells MW-57, MW-58, and MW-66. Based on these results, and considering that soil contamination in the area is a result of groundwater and/or DNAPL migration, it is reasonable to conclude that the soils at depth in the area between TR3-SB-07 and TR3-SB--04 are likely impacted at levels above the Protection of Groundwater SCOs. Using this assumption, **Figure 9** shows the estimated areal extent of soils considered to be impacted. However, this is not to imply that the entire volume of soil in the area is so impacted, because shallower soils may not be, as confirmed by some of the shallower soil data.

4.4 Geotechnical Analytical Results

Eighteen soil samples were submitted to 3rd Rock, LLC for geotechnical analyses. Five of the 18 samples were Shelby tube samples collected from the confining clay layer. These samples were submitted for analysis of Atterberg Limits, water content, and unconsolidated undrained triaxial testing by Methods D4318, D2216, and D2850, respectively. The remaining 13 soil samples were collected from the sand unit beneath the clay and were analyzed for grain size using Method D422. A copy of the geotechnical laboratory report is provided in **Appendix B.**

Results for the five Shelby tube samples were generally consistent with each other with the exception of the sample from TR3-GB-03 (24 to 26 ft). The plasticity index of this sample (3%) was lower than in the other four samples (which ranged from 9% to 15%). Similarly, the compressive strength of 20.4 pounds per square inch (psi) was higher than the other four samples (which ranged from 7.0 to 13.0 psi).

The grain size analytical results for the deposits below the confining clay layer indicate the unit consists primarily of fine sand with trace to some medium sand (TR3-GB-04 and TR3-GB-05 only), trace silt, and trace clay.

4.5 Pumping Test and Hydraulic Conductivity Testing Results

Pumping test and slug test data was analyzed with Aqtesolv, an industry standard program with a variety of solutions including those for confined, unconfined, and leaky aquifer conditions. Five pumping tests and four slug tests were analyzed. The pumping test and hydraulic conductivity testing results are included in **Appendix F**. The following text presents a brief summary of the pumping test and conductivity test results.

The assumptions for the analytical methods include an isotropic aquifer of infinite aerial extent, no boundaries and simple stratigraphy although vertical anisotropy can be included. The site has a complex surficial geology which complicates pump and slug test analyses. Hence, several methods were used to assess aquifer parameters.

Most of the data were analyzed using the Moench method, which utilizes wellbore storage (i.e., the column of water in the well being pumped). The following results for the shallow wells were determined based on the pumping test calculations:

- Transmissivity (T) ranged from 1.2×10^{-3} to 9.3×10^{-7} square meters per day (m^2/day);
- Hydraulic Conductivity (K) ranged from 4.5×10^{-4} to 3.5×10^{-7} meters per second (m/sec);

- Storativity (S) ranged from 0.84 to 2.7 x 10^{-9}; and
- Specific yield (S_y) ranged from 0.25 to 1.0 x 10^{-3}.

The variability of the pumping test and slug test data reflects the variability of the deposits encountered during drilling. Overall these are fairly low permeabilities. Therefore low volumes of water would be expected from the groundwater extraction system proposed in the IRM.

The deep well, MW-54D, showed indications of being in a leaky aquifer with overlying aquitard consistent with the observed stratigraphy. During the course of the test, no drawdown was observed in the nearby shallow observation wells indicating that leakage was likely emanating from aquitard storage. The following results were calculated from the MW-54D test:

- T ranged from 5.7 x 10^{-3} to 8.9 x 10^{-6} m^2/day;
- K ranged from 1.7 x 10^{-3} to 2.7 x 10^{-6} m/sec; and
- S ranged from 3.1 x 10^{-5} to 4.9 x 10^{-9}.

The water level in Sanders Creek was measured periodically during the pumping tests. There was no discernable effect on the Sanders Creek water level from the pumping tests.

The slug tests were analyzed using the Hvorslev method. Since hydraulic conductivity values were also obtained from the pumping tests and serve as a check, only the falling head portion of each test was analyzed. The slug test results produced hydraulic conductivity values ranging from 8.5 x 10^{-5} to 3.8 x 10^{-7} m/sec.

5.0 Summary

The TR-3 North Wall/SWTP Area IRM PDI was completed in accordance with the NYSDEC-approved work plan. The field work involved a geophysical survey; advancing 20 soil borings; completing four soil borings as shallow monitoring wells and one as a deep monitoring well; performing pumping and slug testing; analyzing select soil samples for VOCs, PCBs, and geotechnical parameters; and analyzing groundwater samples for VOCs and PCBs. The information obtained from the investigation provides the information required for IRM design. The information includes:

- The geophysical survey identified locations of buried utilities between Sanders Creek and the TR-3 North Wall.
- Geotechnical data (e.g., soil density, Atterberg limits, depth to bedrock, etc.) obtained from the geotechnical borings along the proposed sheet pile alignment provide the information required for the sheet pile design.
- The pumping and slug tests provide hydraulic conductivity data required to design a groundwater extraction system on the south side of the TR-3 North Wall.
- The installation and sampling of the two shallow monitoring wells on the north side of Sanders Creek confirmed the general absence of soil and groundwater contamination in that area.
- The soil boring analytical results, in combination with previous investigation results, have generally defined the areal extent of impacted soils between the TR3 North Wall and Sanders Creek (see **Figure 9**). The data indicate that the impacts are primarily in the deeper soils. A DNAPL (solvent) phase might be present in the TR3-GB-01 area.
- Groundwater analytical results from this and previous sampling events confirmed that chlorinated VOC impacts are localized to the TR-3 North Wall and SWTP area and present only in the upper water-bearing zone.

The results of the IRM PDI provide sufficient data to proceed with the design of the sheet pile groundwater barrier, and the groundwater extraction system, called for in Step 1 of the IRM.

Additional data and study may be required to complete the design of the soil remediation as called for in Step 2 of the IRM. This may include additional field sampling to refine the area of required remediation, and the evaluation of potentially applicable remedial technologies and excavation methods and procedures.

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Tables

Table 1
Laboratory Analyses
UTC/Carrier TR3 North Wall PDI

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
Soil Boring Samples								
Volatile Organics	SW-846 8260C	54	3	3	2	2	0	64
PCBs	SW-846 8082A	54	3	3	2	2	0	64
Groundwater Samples								
Volatile Organics	SW-846 8260C	5	0	0	0	0	1	6
PCBs	SW-846 8082A	5	0	0	0	0	0	5

Notes:

PCBs = Polychlorinated Biphenyls

LCS = Laboratory Control Sample

*-Although not shown on this table, or in the attached DUSR, since three investigations were being conducted concurrently only 1 MS/MSD Pair and 1 Duplicate sample was collected during groundwater sampling. It is presented in the DUSR for the Debris Pile Investigation.

Table 2
Sample Bottle, Volume, Preservation, and Holding Time Summary
UTC/Carrier TR3 North Wall PDI

MATRIX/ANALYSIS	Sample Prep Method (1)	Analytical Method (1)	Sample Bottles		Preservation	Holding Time	
			Mat'l	Size		Extraction	Analysis
Soil Samples							
Volatile Organics	SW-846 5035A	SW-846 8260C	TerraCore	5 or 25 g	None	NA	48 hours
Polychlorinated Biphenyls	SW-846 3540C/3541/3545A	SW-846 8082A	G	"	None	14 days	40 days from extraction
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 3510C/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.

TABLE 3
Soil Boring and Monitoring Well Details
TR-3 North Wall Area

Boring/ Monitoring Well	Date Installed	Coordinates N	Coordinates E	Surface Elevation (ft)	Total Depth (ft bgs)	Bore Hole Diameter (inches)	Well Diameter (inches)	Measuring Point/Top of Riser Elevation (ft)	Screen Interval (ft bgs)	Screen Interval (Elevations)	Protective Casing	Depth to Water* (ft BTOR)
TR3-GB-01	1/26/16	1124848.81	953773.57	398.105	20.0	10	NA	NA	NA	NA	NA	NA
TR3-GB-02	1/28/16	1124846.05	953676.47	398.667	48.0	10	NA	NA	NA	NA	NA	NA
TR3-GB-03	1/27/16	1124840.16	953587.98	398.490	50.0	10, 4**	2	398.14	34.0 - 50.0	364.5 - 348.5	Flushmount	-7.65
TR3-GB-04	1/22/16	1124835.91	953492.85	399.239	49.0	10	NA	NA	NA	NA	NA	NA
TR3-GB-05	1/21/16	1124850.75	953625.21	397.164	50.0	10	NA	NA	NA	NA	NA	NA
TR3-MW-01	4/8/16	1124885.97	953692.42	393.190	8.0	8	2	392.86	2.0 - 8.0	391.2 - 385.2	Flushmount	0.91
TR3-MW-02	4/8/16	1124906.18	953546.57	395.730	16.0	8	2	395.46	2.0 - 12.0	393.7 - 383.7	Flushmount	2.08
TR3-PW-01	1/14/16	1124815.67	953687.16	405.380	28.0	10	4	405.03	13.0 - 28.0	392.4 - 377.4	Flushmount	12.18
TR3-PW-02	1/15/16	1124805.52	953444.97	406.140	28.0	10	4	405.59	11.0 - 26.0	395.1 - 380.1	Flushmount	11.35
TR3-SB-01	4/14/16	1124879.54	953810.60	392.802	12.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-02	4/11/16	1124854.65	953735.42	397.377	16.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-03	4/11/16	1124853.45	953700.64	397.390	16.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-04	4/11/16	1124852.34	953666.39	397.311	16.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-05	4/11/16	1124849.63	953625.11	397.259	4.5	2	NA	NA	NA	NA	NA	NA
TR3-SB-06	1/11/16	1124862.17	953583.69	NS	5.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-07	4/14/16	1124876.60	953510.47	393.041	10.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-08	4/11/16	1124865.07	953443.60	396.173	14.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-09	4/14/16	1124882.71	953436.16	392.037	10.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-10	4/11/16	1124856.07	953407.24	397.173	16.0	2	NA	NA	NA	NA	NA	NA
TR3-SB-11	4/14/16	1124850.79	953819.38	397.471	16.0	2	NA	NA	NA	NA	NA	NA

Notes
1. Horizontal grid based on New York State Plane Central Zone (NAD 83).
2. Vertical datum NAVD 88.
NA = Not Applicable
NS = Not Surveyed
* - Depth to water measured on April 18-19, 2016. Artesian well was measured on May 17, 2016 using a temporary extension.
** - Upper borehole diameter is 10 inche auger hole. Borehole diameter below separation casing is 4 inches.
BTOR = Below top of riser

TABLE 4
Summary of Drilling Observations
TR-3 North Wall Area

Location ID	Total Depth (ft bgs)	Depth to Water (ft bgs)	Max PID Reading (ppm)	General Description
TR3-PW-01	28.0	16.5	367 at 24 ft	Fill and concrete slab to 4 ft. Red brown sand to 13 ft. Interlayered gray clayey silt to silty clay to 24 ft. Gray clay at 24 ft.
TR3-PW-02	28.0	10.0	ND	Fill and concrete slab to 7 ft underlain by silty clay. Concrete at 13.5 to 14 ft, then brown gray silty clay to 23.5 ft. Silt lens at 23.5 to 24 ft. Brown gray clay at 24 ft.
TR3-GB-01	20.0	8.0	>9999 at 17 ft	Fill consisting of interlayered brown silt, sand, and gravel to 14 ft then silty clay to clayey silt to 18 ft. Gray clay at 18 ft. Solvent odor. DNAPL droplet near top of clay.
TR3-GB-02	48.0	9.0	20.2 at 13 ft	Fill to 4 ft. Red brown sand to 8 ft. Interlayered brown gray to gray silty clay to clayey silt to 17 ft. Gray clay to 25.5 ft. Brown gray clayey silt to 34 ft. Red brown sand to 44 ft. Red brown weathered shale at 44 ft.
TR3-GB-03	50.0	9.0	ND	Fill to 5 ft. Interlayered brown to gray clayey silt to silty clay to 17 ft. Gray clay to 24.5 ft. Brown gray silt to 32.5 ft. Fine to medium sand to 36 ft. Red brown clayey silt to 48 ft. Red brown weathered shale at 48 ft.
TR3-GB-04	49.0	9.0	ND	Fill to 5 ft. Interlayered brown to gray clayey silt to silty clay to 18 ft then gray brown to gray clay to 27 ft. Brown gray clayey silt to 38.5 ft. Fine to medium sand to 41 ft. Red brown clayey silt to 47 ft. Red brown weathered shale to 48.5 ft. Competent green-gray shale at 48.5 ft.
TR3-GB-05	50.0	12.0	ND	Fill to 5 ft then brown to gray interlayered silty clay to clayey silt to 17 ft. Gray clay to 28 ft. Brown gray clayey silt to 38 ft. Brown to gray fine to medium sand to 42 ft. Gray silty clay to 44 ft. Red brown silty sand to 46 ft. Clayey silt to 48 ft. Red brown to green gray shale at 48 ft.
TR3-SB-01	12.0	2.5	2.4 at 10 ft	Interlayered brown silty clay and clayey silt over gray clay at 10 ft. Silty fine sand lens at 7 to 8 ft
TR3-SB-02	16.0	10.0	3.2 at 12 ft	Interlayered brown silty clay and clayey silt over gray clay at 14 ft.
TR3-SB-03	16.0	6.0	ND	Interlayered brown silty clay and clayey silt over gray clay at 14 ft.
TR3-SB-04	16.0	6.5	ND	Fill to 5 ft. Interlayered brown silty clay and clayey silt over gray clay at 14.5 ft.
TR3-SB-05	4.5	-	ND	Brown clayey silt. Refusal at 4.5 ft on concrete.
TR3-SB-06	5.0	-	ND	Brown silty clay. Terminated at 5 ft, could not safely advance boring with rig.
TR3-SB-07	10.0	4.0	24.5 at 5.5 ft	Interlayered brown to gray silty clay and clayey silt over gray clay at 8.5 ft.
TR3-SB-08	14.0	8.0	ND	Interlayered brown to gray silty clay and clayey silt over gray clay at 13 ft.
TR3-SB-09	10.0	2.0	ND	Brown to gray clayey silt over gray clay at 8 ft. Fine sand lens at 7.8 to 8 ft.
TR3-SB-10	16.0	8.0	ND	Interlayered brown silty clay and clayey silt to 8 ft. Sand at 8 to 9.5 ft, silt from 9.5 to 12, and sand at 12 to 14 ft. Gray silty clay at 14 ft. Gray Clay at 15 ft.
TR3-SB-11	16.0	4.0	ND	Brown to gray clayey silt with gravel to 12 ft. sand from 12 to 13 ft. Gray clay at 13 ft.
TR3-MW-01	8.0	4.0	ND	Interlayered brown to gray silt, silty clay, clayey silt, and silty fine sand over gray clay at 12.4 ft.
TR3-MW-02	16.0	3.0	ND	Interlayered brown to gray silt, silty clay, clayey silt, and silty fine sand over gray clay at 7.8 ft.

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-GB-01	TR3-GB-01	TR3-GB-02	TR3-GB-02	TR3-GB-02
Sample ID				GB-01-6-8	GB-01-16.8-17.2	GB-02-7-9	GB-02-13-15	GB-02-20-22
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				6.0-8.0	16.8-17.2	7.0-9.0	13.0-15.0	20.0-22.0
Date Sampled				01/26/16	01/26/16	01/25/16	01/25/16	01/28/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	1.6 U	4,400 U	1.8 U	590 U	2.5 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	1.6 U	4,400 U	1.8 U	590 U	2.5 U
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	36.1	17,600	1.2 J	38,600	2.5 U
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	0.74 J	4,400 U	1.8 U	168 J	2.5 U
Acetone	UG/KG	50	1.00E+06	6.4 J	22,000 U	33.7 J	2,900 U	R
Benzene	UG/KG	60	89000	0.41 U	1,100 U	0.54	150 U	0.63 U
Carbon disulfide	UG/KG	2700	-	4 U	11,000 U	4.5 U	1,500 U	6.3 U
Chloroform	UG/KG	370	7.00E+05	1.6 U	4,400 U	1.8 U	590 U	2.5 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	R	R	R	R	R
Methylene chloride	UG/KG	50	1.00E+06	1.6 U	4,400 U	1.8 U	590 U	2.5 U
Tetrachloroethene	UG/KG	1300	3.00E+05	1.6 U	2,970 J	1.8 U	590 U	2.5 U
Toluene	UG/KG	700	1.00E+06	4 U	11,000 U	4.5 U	1,500 U	6.3 U
Trichloroethene	UG/KG	470	4.00E+05	20.6	1,120,000 D	0.67 J	590 U	2.5 U
Vinyl chloride	UG/KG	20	27000	1.6 U	4,400 U	1.8 U	207 J	2.5 U
Xylene (total)	UG/KG	1600	1.00E+06	1.6 U	4,400 U	1.8 U	590 U	2.5 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	56.8 J	23.0 J	25.9 J	43 U	47 U
Aroclor 1260	UG/KG	-	-	231	29.8 J	23.1 J	43 U	47 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	287.8 J	52.8 J	49 J	43 U	47 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

R - The data is rejected.

UJ - Not detected. The reported quantitation limit is an estimated value.

U - Not detected above the reported quantitation limit. ; J - The reported concentration is an estimated value.

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Detection Limits shown are PQL

Advanced Selection: TR3 Soils
#Error
Printed: 7/19/2016 9:13:17 AM
[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-GB-03	TR3-GB-03	TR3-GB-03	TR3-GB-04	TR3-GB-04
Sample ID				GB-03-7-9	GB-03-9-11	GB-03-11-13	GB-04-9-11	GB-04-11-13
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				7.0-9.0	9.0-11.0	11.0-13.0	9.0-11.0	11.0-13.0
Date Sampled				01/25/16	01/25/16	01/25/16	01/19/16	01/19/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	2.1 U	2.0 U	1.8 U	2.5 U	2.3 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	2.1 U	2.0 U	1.8 U	2.5 U	2.3 U
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	0.77 J	0.79 J	1.8 U	2.5 U	2.3 U
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	0.80 J	2.0 U	1.8 U	2.5 U	2.3 U
Acetone	UG/KG	50	1.00E+06	121 J	25.0 J	R	132 J	129 J
Benzene	UG/KG	60	89000	0.73	0.49 U	0.46 U	0.62 U	0.58 U
Carbon disulfide	UG/KG	2700	-	5.0 U	4.0 U	4 U	6.2 U	2.3 J
Chloroform	UG/KG	370	7.00E+05	2.1 U	2.0 U	1.8 U	2.5 U	2.3 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	R	R	R	R	13.1 J
Methylene chloride	UG/KG	50	1.00E+06	2.1 U	2.0 U	1.8 U	2.5 U	2.3 U
Tetrachloroethene	UG/KG	1300	3.00E+05	2.1 U	2.0 U	1.8 U	2.5 U	2.3 U
Toluene	UG/KG	700	1.00E+06	1.2 J	4.0 U	4 U	6.2 U	5.8 U
Trichloroethene	UG/KG	470	4.00E+05	1.3 J	2.7	1.8 U	2.5 U	2.3 U
Vinyl chloride	UG/KG	20	27000	2.1 U	2.0 U	1.8 U	2.5 U	2.3 U
Xylene (total)	UG/KG	1600	1.00E+06	0.38 J	2.0 U	1.8 U	2.5 U	2.3 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	38.2 J	41 U	39 U	46 U	40 U
Aroclor 1260	UG/KG	-	-	57.1	41 U	39 U	46 U	40 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	95.3 J	41 U	39 U	46 U	40 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

R - The data is rejected.

UJ - Not detected. The reported quantitation limit is an estimated value.

U - Not detected above the reported quantitation limit. ; J - The reported concentration is an estimated value.

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Detection Limits shown are PQL

Advanced Selection: TR3 Soils
#Error
Printed: 7/19/2016 9:13:18 AM
[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-GB-04	TR3-GB-05	TR3-GB-05	TR3-GB-05	TR3-GB-05
Sample ID				GB-04-13-15	GB-05-5-7	GB-05-7-9	FD-011916	GB-05-15-17
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				13.0-15.0	5.0-7.0	7.0-9.0	15.0-17.0	15.0-17.0
Date Sampled				01/19/16	01/19/16	01/19/16	01/19/16	01/19/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**				Field Duplicate (1-1)	
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
Acetone	UG/KG	50	1.00E+06	R	98.7 J	22.9 J	19.4 J	19.0 J
Benzene	UG/KG	60	89000	1.4	0.51 U	0.49 U	0.59 U	0.59 U
Carbon disulfide	UG/KG	2700	-	4.2 J	5.1 U	2.9 J	5.9 UJ	5.9 U
Chloroform	UG/KG	370	7.00E+05	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	7.8 J	12.8 J	R	R	R
Methylene chloride	UG/KG	50	1.00E+06	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
Tetrachloroethene	UG/KG	1300	3.00E+05	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
Toluene	UG/KG	700	1.00E+06	2.4 J	5.1 U	4.9 U	5.9 U	5.9 U
Trichloroethene	UG/KG	470	4.00E+05	2.4 U	2.0 U	6.7	2.3 U	2.3 U
Vinyl chloride	UG/KG	20	27000	2.4 U	2.0 U	2.0 U	2.3 U	2.3 U
Xylene (total)	UG/KG	1600	1.00E+06	2.3 J	2.0 U	2.0 U	2.3 U	2.3 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	42 U	41 U	41 U	43 U	39 U
Aroclor 1260	UG/KG	-	-	42 U	41 U	41 U	43 U	39 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	42 U	41 U	41 U	43 U	39 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

R - The data is rejected.

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Only Detected Results Reported.

Detection Limits shown are PQL

Advanced Selection: TR3 Soils
#Error
Printed: 7/19/2016 9:13:18 AM
[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-MW-01	TR3-MW-01	TR3-MW-01	TR3-MW-02	TR3-MW-02
Sample ID				MW-01-2-3	MW-01-3-4	MW-01-4-5	MW-02-3-4	MW-02-4-5
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				2.0-3.0	3.0-4.0	4.0-5.0	3.0-4.0	4.0-5.0
Date Sampled				01/12/16	01/12/16	01/12/16	01/12/16	01/12/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	0.95 J	0.91 J	2.6 U	2.0 U	2.2 U
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Acetone	UG/KG	50	1.00E+06	37.5 J	28.0 J	6.5 J	23.9 J	6.8 J
Benzene	UG/KG	60	89000	0.61 U	0.55 U	0.65 U	0.49 U	0.55 U
Carbon disulfide	UG/KG	2700	-	0.88 J	5.5 U	1.9 J	1.7 J	5.5 U
Chloroform	UG/KG	370	7.00E+05	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	R	R	R	R	R
Methylene chloride	UG/KG	50	1.00E+06	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Tetrachloroethene	UG/KG	1300	3.00E+05	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Toluene	UG/KG	700	1.00E+06	6.1 U	5.5 U	6.5 U	4.9 U	5.5 U
Trichloroethene	UG/KG	470	4.00E+05	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Vinyl chloride	UG/KG	20	27000	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Xylene (total)	UG/KG	1600	1.00E+06	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	42 U	42 U	45 U	40 U	43 U
Aroclor 1260	UG/KG	-	-	50.7	47.9	45 U	40 U	43 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	50.7	47.9	45 U	40 U	43 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

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Advanced Selection: TR3 Soils
#Error
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TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-MW-02	TR3-PW-01	TR3-PW-01	TR3-PW-01	TR3-PW-02
Sample ID				TR3MW-02-7-7.5	PW-1-14-16	PW-1-24-26	PW-1-26-28	PW-2-14-16
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				7.0-7.5	14.0-16.0	24.0-26.0	26.0-28.0	14.0-16.0
Date Sampled				04/08/16	01/13/16	01/13/16	01/13/16	01/15/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	3.4 U	2.6 U	2,300 U	2,800 U	2.3 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	3.4 UJ	2.6 U	2,300 U	2,800 U	2.3 U
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	3.4 U	2.6 U	9,610	11,400	2.3 U
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	3.4 U	2.6 U	2,300 U	2,800 U	2.3 U
Acetone	UG/KG	50	1.00E+06	17 UJ	16.2 J	11,000 U	14,000 U	19.3 J
Benzene	UG/KG	60	89000	0.85 U	0.65 U	570 U	700 U	0.57 U
Carbon disulfide	UG/KG	2700	-	0.91 J	6.5 UJ	5,700 U	7,000 U	1.4 J
Chloroform	UG/KG	370	7.00E+05	3.4 U	2.6 U	2,300 U	2,800 U	2.3 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	34 UJ	R	R	R	R
Methylene chloride	UG/KG	50	1.00E+06	3.4 U	2.6 U	2,300 U	2,800 U	2.3 U
Tetrachloroethene	UG/KG	1300	3.00E+05	3.4 U	2.6 U	1,070 J	3,380	2.3 U
Toluene	UG/KG	700	1.00E+06	8.5 U	6.5 U	5,700 U	7,000 U	5.7 U
Trichloroethene	UG/KG	470	4.00E+05	3.4 U	2.6 U	250,000	321,000	10.5
Vinyl chloride	UG/KG	20	27000	14.5 J	2.6 U	2,300 U	2,800 U	2.3 UJ
Xylene (total)	UG/KG	1600	1.00E+06	3.4 U	2.6 U	2,300 U	2,800 U	2.3 UJ
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	40 U	42 U	40 U	40 U	42 U
Aroclor 1260	UG/KG	-	-	40 U	42 U	40 U	40 U	42 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	40 U	42 U	40 U	40 U	42 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

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Concentration Exceeds Criteria (2)

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TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-PW-02	TR3-SB-01	TR3-SB-01	TR3-SB-01	TR3-SB-02
Sample ID				PW-2-23.4-24	TR3-SB01(1-2)	TR3-SB01(3-4)	TR3-SB01(10-12)	TR3-SB02 (8-10)
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				23.5-24.0	1.0-2.0	3.0-4.0	10.0-12.0	8.0-10.0
Date Sampled				01/15/16	04/14/16	04/14/16	04/14/16	04/11/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	2.1 U	2.0 U	2.0 U	1,200 U	1.1 J
1,1-Dichloroethene	UG/KG	330	1.00E+06	2.1 U	2.0 U	2.0 U	1,200 U	1.0 J
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	2.1 U	0.48 J	1.5 J	9,260	414
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	2.1 U	2.0 U	2.0 U	1,200 U	11.6
Acetone	UG/KG	50	1.00E+06	10.9 J	10 UJ	123 J	R	271 J
Benzene	UG/KG	60	89000	0.52 U	0.41 J	0.66 U	310 U	0.64 U
Carbon disulfide	UG/KG	2700	-	5.2 UJ	1.4 J	3.5 J	3,100 UJ	5.9 J
Chloroform	UG/KG	370	7.00E+05	2.1 U	0.53 J	2.0 U	1,200 U	2.6 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	R	20 U	26 UJ	R	17.5 J
Methylene chloride	UG/KG	50	1.00E+06	2.1 U	2.0 U	2.0 U	1,200 U	0.70 J
Tetrachloroethene	UG/KG	1300	3.00E+05	2.1 U	2.0 U	2.0 U	784 J	2.6 U
Toluene	UG/KG	700	1.00E+06	5.2 U	5.0 U	6.6 U	3,100 U	6.4 U
Trichloroethene	UG/KG	470	4.00E+05	2.1 U	13.2	4.3	197,000	2.5 J
Vinyl chloride	UG/KG	20	27000	2.1 UJ	2.0 U	2.0 U	1,200 U	72.2 J
Xylene (total)	UG/KG	1600	1.00E+06	2.1 UJ	2.0 U	2.0 U	1,200 U	2.6 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	39 U	39 U	44 U	40 U	45 U
Aroclor 1260	UG/KG	-	-	39 U	126	44 U	24.7 J	45 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	39 U	126	44 U	24.7 J	45 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

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Detection Limits shown are PQL

Advanced Selection: TR3 Soils
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[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-SB-02	TR3-SB-02	TR3-SB-02	TR3-SB-03	TR3-SB-03
Sample ID				DUP-041116	TR3-SB02 (12-14)	TR3-SB02 (14-16)	TR3-SB03 (6-8)	TR3-SB03 (8-10)
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				12.0-14.0	12.0-14.0	14.0-16.0	6.0-8.0	8.0-10.0
Date Sampled				04/11/16	04/11/16	04/11/16	04/11/16	04/11/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	Field Duplicate (1-1)				
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	1,400 U	2,500 U	2,600 U	2.5 UJ	2.6 UJ
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	15,400	22,200	9,160	3.0	175
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	1,400 U	2,500 U	2,600 U	2.5 U	6.3
Acetone	UG/KG	50	1.00E+06	R	R	R	183 J	125 J
Benzene	UG/KG	60	89000	350 U	620 U	660 U	0.60 J	0.64 U
Carbon disulfide	UG/KG	2700	-	3,500 U	6,200 U	6,600 U	18.7 J	15.8 J
Chloroform	UG/KG	370	7.00E+05	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	R	R	R	25 UJ	13 UJ
Methylene chloride	UG/KG	50	1.00E+06	1,400 U	2,500 U	2,600 U	0.68 J	2.6 U
Tetrachloroethene	UG/KG	1300	3.00E+05	1,400 U	2,500 U	684 J	2.5 U	2.6 U
Toluene	UG/KG	700	1.00E+06	3,500 U	6,200 U	6,600 U	0.85 J	6.4 U
Trichloroethene	UG/KG	470	4.00E+05	151,000	225,000	292,000	15.6	13.1
Vinyl chloride	UG/KG	20	27000	1,400 U	2,500 U	2,600 U	2.5 UJ	86.0 J
Xylene (total)	UG/KG	1600	1.00E+06	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	39 U	41 U	42 U	198 J	46 U
Aroclor 1260	UG/KG	-	-	39 U	41 U	42 U	244	46 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	39 U	41 U	42 U	442 J	46 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

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Advanced Selection: TR3 Soils
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[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-SB-03	TR3-SB-04	TR3-SB-04	TR3-SB-04	TR3-SB-07
Sample ID				TR3-SB03 (12-14)	TR3-SB04 (5-6.5)	TR3-SB04 (6.5-8)	TR3-SB04 (8.5-10.5)	SB-07-3-4
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				12.0-14.0	5.0-6.5	6.5-8.0	8.5-10.5	3.0-4.0
Date Sampled				04/11/16	04/11/16	04/11/16	04/11/16	01/12/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	2.0 U	1.9 U	210 U	250 U	2.0 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	2.0 UJ	1.9 U	210 U	250 U	2.5 J
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	3.4 J	1.6 J	1,000	13,700	757 D
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	2.0 U	0.48 J	210 U	250 U	5.4 J
Acetone	UG/KG	50	1.00E+06	9.9 UJ	210 J	R	R	10
Benzene	UG/KG	60	89000	0.50 U	0.60	53 U	61 U	0.50 U
Carbon disulfide	UG/KG	2700	-	0.74 J	3.1 J	530 U	610 U	5.0 UJ
Chloroform	UG/KG	370	7.00E+05	2.0 U	1.9 U	210 U	250 U	2.0 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	20 UJ	19.2 J	R	R	54.8 J
Methylene chloride	UG/KG	50	1.00E+06	2.0 U	1.9 U	210 U	250 U	2.0 U
Tetrachloroethene	UG/KG	1300	3.00E+05	2.0 U	1.9 U	210 U	250 U	2.0 U
Toluene	UG/KG	700	1.00E+06	5.0 U	4.7 U	530 U	610 U	0.47 J
Trichloroethene	UG/KG	470	4.00E+05	2.0 U	1.4 J	210 U	250 U	20.4
Vinyl chloride	UG/KG	20	27000	41.7 J	1.9 UJ	398	2,240	156 J
Xylene (total)	UG/KG	1600	1.00E+06	2.0 U	1.9 U	210 U	250 U	2.0 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	39 U	80.2 J	38 U	41 U	40 U
Aroclor 1260	UG/KG	-	-	39 U	111	38 U	41 U	40 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	39 U	191.2 J	38 U	41 U	40 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

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Advanced Selection: TR3 Soils
#Error
Printed: 7/19/2016 9:13:19 AM
[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-SB-07	TR3-SB-07	TR3-SB-07	TR3-SB-08	TR3-SB-08
Sample ID				SB-07-4-5	TR3-SB07(5.5-6.5)	TR3-SB07(9-10)	TR3-SB08 (5-6)	TR3-SB08 (8-10)
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				4.0-5.0	5.5-6.5	9.0-10.0	5.0-6.0	8.0-10.0
Date Sampled				01/12/16	04/14/16	04/14/16	04/11/16	04/11/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	240 U	230 U	1,300 U	2.0 U	0.74 J
1,1-Dichloroethene	UG/KG	330	1.00E+06	240 U	230 U	1,300 U	2.0 UJ	1.9 UJ
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	10,100	11,800	48,800	2.0 U	1.9 U
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	53.0 J	61.7 J	314 J	2.0 U	1.9 U
Acetone	UG/KG	50	1.00E+06	1,200 U	R	R	112 J	203 J
Benzene	UG/KG	60	89000	61 U	58 U	340 U	0.64	0.72
Carbon disulfide	UG/KG	2700	-	610 U	580 U	3,400 U	1.4 J	0.70 J
Chloroform	UG/KG	370	7.00E+05	240 U	230 U	1,300 U	2.0 U	1.9 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	R	1,550 J	R	20 UJ	19 UJ
Methylene chloride	UG/KG	50	1.00E+06	240 U	230 U	1,300 U	2.0 U	0.64 J
Tetrachloroethene	UG/KG	1300	3.00E+05	240 U	230 UJ	1,300 UJ	2.0 U	1.9 U
Toluene	UG/KG	700	1.00E+06	610 U	580 U	3,400 U	0.65 J	0.91 J
Trichloroethene	UG/KG	470	4.00E+05	1,460	11,300	219,000	2.0 U	1.9 U
Vinyl chloride	UG/KG	20	27000	513	230 U	1,300 U	2.0 UJ	1.9 UJ
Xylene (total)	UG/KG	1600	1.00E+06	240 U	230 U	1,300 U	2.0 U	1.9 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	38 U	40 U	40 U	40 U	39 U
Aroclor 1260	UG/KG	-	-	38 U	40 U	40 U	40 U	39 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	38 U	40 U	40 U	40 U	39 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

R - The data is rejected.

UJ - Not detected. The reported quantitation limit is an estimated value.

U - Not detected above the reported quantitation limit. ; J - The reported concentration is an estimated value.

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Detection Limits shown are PQL

Advanced Selection: TR3 Soils
#Error
Printed: 7/19/2016 9:13:19 AM
[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-SB-08	TR3-SB-09	TR3-SB-09	TR3-SB-09	TR3-SB-10
Sample ID				TR3-SB08 (12-13)	SB-09-1-2	SB-09-2-3	SB-09-3-4	TR3-SB10 (6-8)
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				12.0-13.0	1.0-2.0	2.0-3.0	3.0-4.0	6.0-8.0
Date Sampled				04/11/16	01/12/16	01/12/16	01/12/16	04/11/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	2.3 U	2.2 U	2.6 U	2.0 U	2.6 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	2.3 UJ	2.2 U	2.6 U	2.0 U	2.6 UJ
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	2.3 U	1.2 J	2.5 J	1.4 J	1.2 J
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	2.3 U	2.2 U	2.6 U	2.0 U	2.6 U
Acetone	UG/KG	50	1.00E+06	104 J	70.8 J	19.3 J	29.3 J	160 J
Benzene	UG/KG	60	89000	0.58 U	0.84	0.54 J	1.1	0.65 U
Carbon disulfide	UG/KG	2700	-	0.58 J	4.4 J	6.4 UJ	1.6 J	0.92 J
Chloroform	UG/KG	370	7.00E+05	2.3 U	2.2 U	2.6 U	2.0 U	2.6 U
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	23 UJ	R	R	R	26 UJ
Methylene chloride	UG/KG	50	1.00E+06	2.3 U	2.2 U	2.6 U	2.0 U	2.6 U
Tetrachloroethene	UG/KG	1300	3.00E+05	2.3 U	2.2 U	2.6 U	2.0 U	2.6 U
Toluene	UG/KG	700	1.00E+06	5.8 U	0.86 J	0.51 J	0.78 J	6.5 U
Trichloroethene	UG/KG	470	4.00E+05	2.3 U	4.2	5.1	2.0	2.6 U
Vinyl chloride	UG/KG	20	27000	2.3 UJ	2.2 U	2.6 U	2.0 U	2.6 UJ
Xylene (total)	UG/KG	1600	1.00E+06	2.3 U	0.44 J	2.6 U	0.35 J	2.6 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	41 U	39 U	46 U	41 U	223
Aroclor 1260	UG/KG	-	-	41 U	199	47.5	41 U	106 J
Total Polychlorinated Biphenyls	UG/KG	3200	25000	41 U	199	47.5	41 U	329 J

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

R - The data is rejected.

UJ - Not detected. The reported quantitation limit is an estimated value.

U - Not detected above the reported quantitation limit. ; J - The reported concentration is an estimated value.

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Detection Limits shown are PQL

Advanced Selection: TR3 Soils
#Error
Printed: 7/19/2016 9:13:19 AM
[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 5
SOIL ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID				TR3-SB-10	TR3-SB-10	TR3-SB-11	TR3-SB-11	TR3-SB-11
Sample ID				TR3-SB10 (8-10)	TR3-SB10 (12-14)	TR3-SB11(4-8)	TR3-SB11(8-12)	TR3-SB11(13-14)
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				8.0-10.0	12.0-14.0	4.0-8.0	8.0-12.0	13.0-14.0
Date Sampled				04/11/16	04/11/16	04/14/16	04/14/16	04/14/16
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,1-Dichloroethane	UG/KG	270	4.80E+05	2.1 U	7.0	210 U	1.8 U	1.9 U
1,1-Dichloroethene	UG/KG	330	1.00E+06	2.1 UJ	2.2 U	210 U	1.8 U	1.9 U
1,2-Dichloroethene (cis)	UG/KG	250	1.00E+06	2.1 U	27.0	287	1.8 U	1.9 U
1,2-Dichloroethene (trans)	UG/KG	190	1.00E+06	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Acetone	UG/KG	50	1.00E+06	76.7 J	284 J	R	9.1 UJ	9.6 UJ
Benzene	UG/KG	60	89000	0.54 U	0.55	53 U	0.46 U	0.48 U
Carbon disulfide	UG/KG	2700	-	1.1 J	5.5 U	530 UJ	1.1 J	0.63 J
Chloroform	UG/KG	370	7.00E+05	2.1 U	2.2 U	210 U	1.8 UJ	1.9 UJ
Methyl ethyl ketone (2-Butanone)	UG/KG	120	1.00E+06	21 UJ	25.1 J	R	18 U	19 U
Methylene chloride	UG/KG	50	1.00E+06	2.1 U	2.2 U	210 U	1.1 J	1.9 U
Tetrachloroethene	UG/KG	1300	3.00E+05	2.1 U	2.2 U	210 UJ	1.8 U	1.9 U
Toluene	UG/KG	700	1.00E+06	5.4 U	5.5 U	530 U	4.6 U	4.8 U
Trichloroethene	UG/KG	470	4.00E+05	2.1 U	2.2 U	514	1.8 U	1.9 U
Vinyl chloride	UG/KG	20	27000	2.1 UJ	40.3 J	210 U	1.8 U	1.9 U
Xylene (total)	UG/KG	1600	1.00E+06	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Polychlorinated Biphenyls								
Aroclor 1254	UG/KG	-	-	41 U	40 U	23.1 J	41 U	41 U
Aroclor 1260	UG/KG	-	-	41 U	40 U	40.4	41 U	41 U
Total Polychlorinated Biphenyls	UG/KG	3200	25000	41 U	40 U	63.5 J	41 U	41 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

R - The data is rejected.

UJ - Not detected. The reported quantitation limit is an estimated value.

U - Not detected above the reported quantitation limit. ; J - The reported concentration is an estimated value.

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Detection Limits shown are PQL

Advanced Selection: TR3 Soils
#Error
Printed: 7/19/2016 9:13:19 AM
[SITE KEY] = 1 AND [MATRIX] = 'SO' AND [LOCID] <> 'DRUM COMPOSITE

TABLE 6
GROUNDWATER ANALYTICAL RESULTS
TR-3 NORTH WALL

Location ID			TR3-GB-03	TR3-MW-01	TR3-MW-02	TR3-PW-01	TR3-PW-02
Sample ID			TR3-GB-03	TR3-MW01	TR3-MW02	TR3-PW1	TR3-PW-2
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			04/19/16	04/18/16	04/18/16	04/18/16	04/19/16
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1-Dichloroethane	UG/L	5	1.0 U	1.0 U	1.0 U	1.9	1.0 U
1,1-Dichloroethene	UG/L	5	1.0 U	1.0 U	1.0 U	136	1.0 U
1,2-Dichloroethene (cis)	UG/L	5	1.0 U	1.0 U	1.0 U	12,500 DJ	1.0 U
1,2-Dichloroethene (trans)	UG/L	5	1.0 U	1.0 U	1.0 U	47.6	1.0 U
Acetone	UG/L	50	R	R	10 UJ	18.8 J	10 UJ
Tetrachloroethene	UG/L	5	1.0 U	1.0 U	1.0 U	77.6	1.0 U
Toluene	UG/L	5	1.0 U	1.0 U	1.0 U	2.1	1.0 U
Trichloroethene	UG/L	5	0.71 J	1.0 U	1.0 U	195,000 DJ	2.0
Vinyl chloride	UG/L	2	1.0 UJ	1.0 UJ	1.3 J	107 J	1.0 UJ
Xylene (total)	UG/L	5	1.0 U	1.0 U	1.0 U	1.0	1.0 U

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including January 1999 Errata Sheet, April 2000 and June 2004 Addenda. Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

U - Not detected above the reported quantitation limit. ; J - The reported concentration is an estimated value.

D - Result reported from a secondary dilution analysis.

DJ - Result reported from a secondary dilution analysis and the reported concentration is an estimated value.

R - The data is rejected.

Only Detected Results Reported.

Detection Limits shown are PQL

Advanced Selection: TR3 Wate
#Error
Printed: 7/19/2016 9:17:18 AM
[SITE KEY] = 1 AND [MATRIX] = 'WG' AND [LOCID] <> 'DRUM COMPOSITE

Figures

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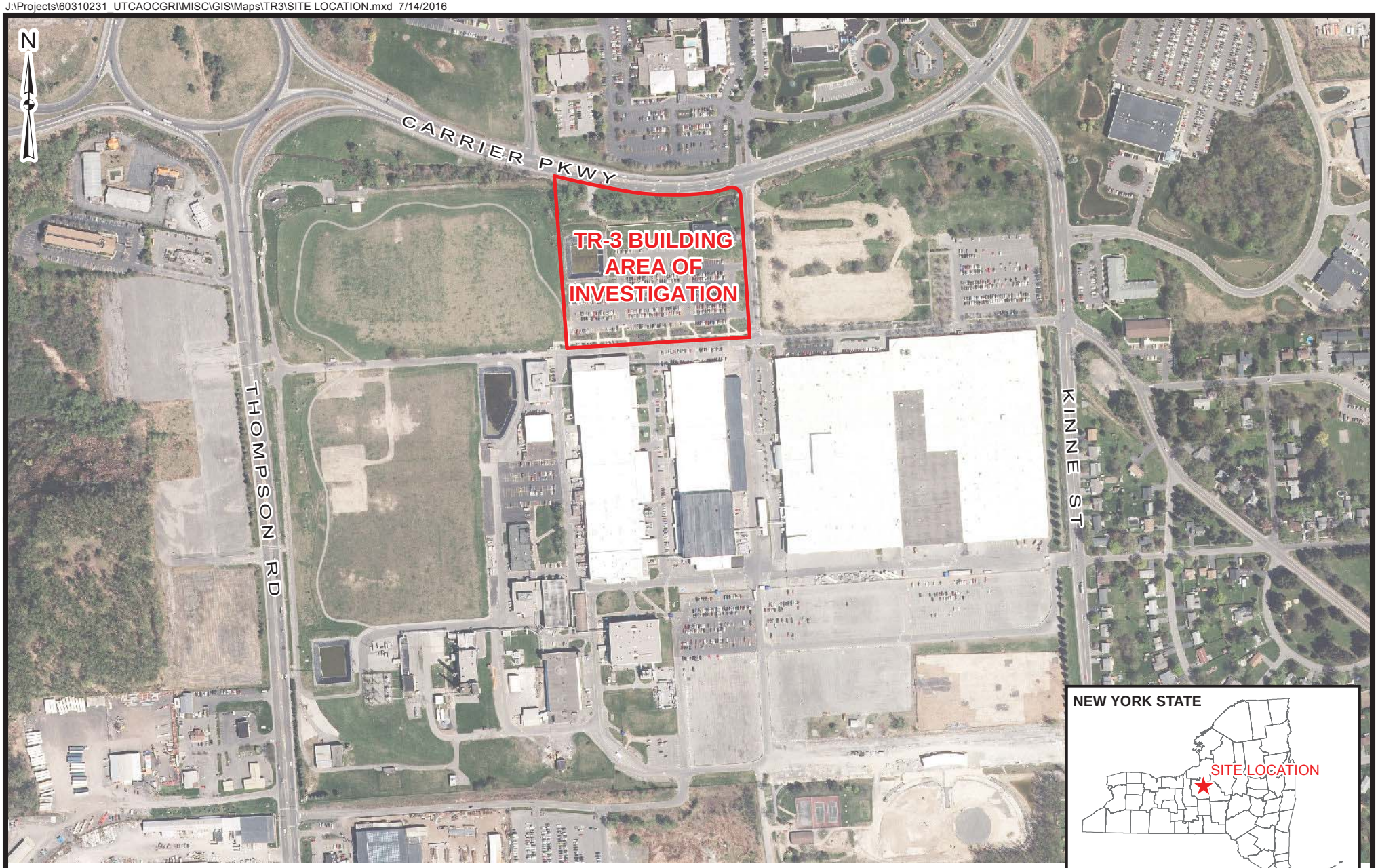


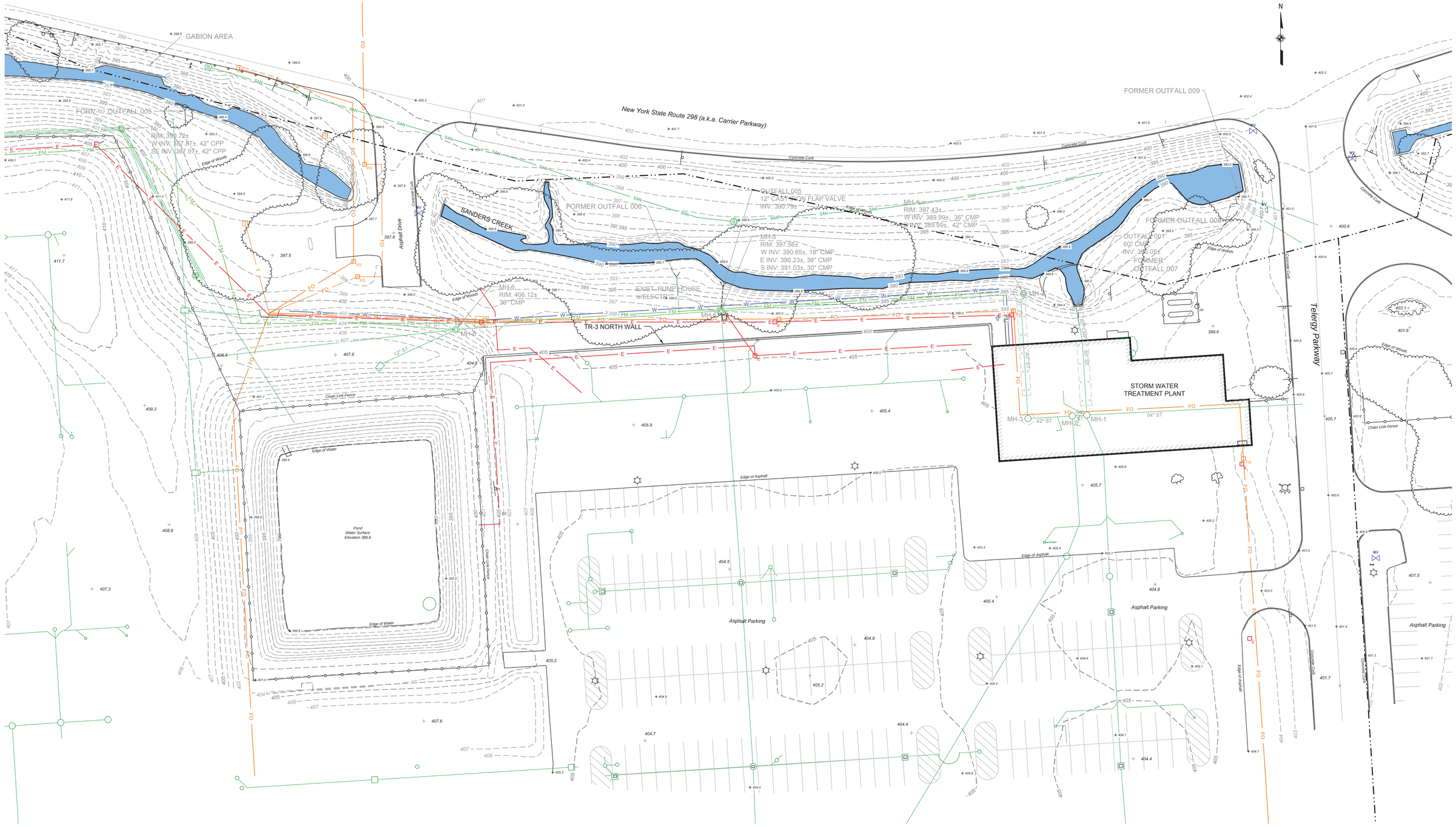
SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

AECOM

TR-3 NORTH WALL/ SWTP
UTC/CARRIER SITE
SITE LOCATION

FIGURE 1

DRAFT



EXISTING SITE CONDITIONS

SCALE: 1" = 60'-0"

0 30' 60'

NOTES:

1. TOPOGRAPHIC AND PLANIMETRIC FEATURES SHOWN HEREON WERE MAPPED UTILIZING PHOTOGRAMMETRIC MAPPING TECHNIQUES PERFORMED BY THEW ASSOCIATES LAND SURVEYORS. THE AERIAL PHOTOGRAPHY WAS OBTAINED ON NOVEMBER 16, 2013. A FIELD EDIT WAS PERFORMED BY THEW ASSOCIATES LAND SURVEYORS ON JANUARY 3, 2014 TO VERIFY THE ACCURACY AND COMPLETENESS OF THE PHOTOGRAMMETRIC MAPPING.

2. EXISTING STORM SEWER MANHOLE RIM AND INVERT ELEVATIONS TAKEN FROM ENSAFE'S "TR-3 WALL INVESTIGATION REPORT", FIGURE 1, DATED JANUARY 2015. ELEVATIONS ADJUSTED TO CURRENT DATUM.

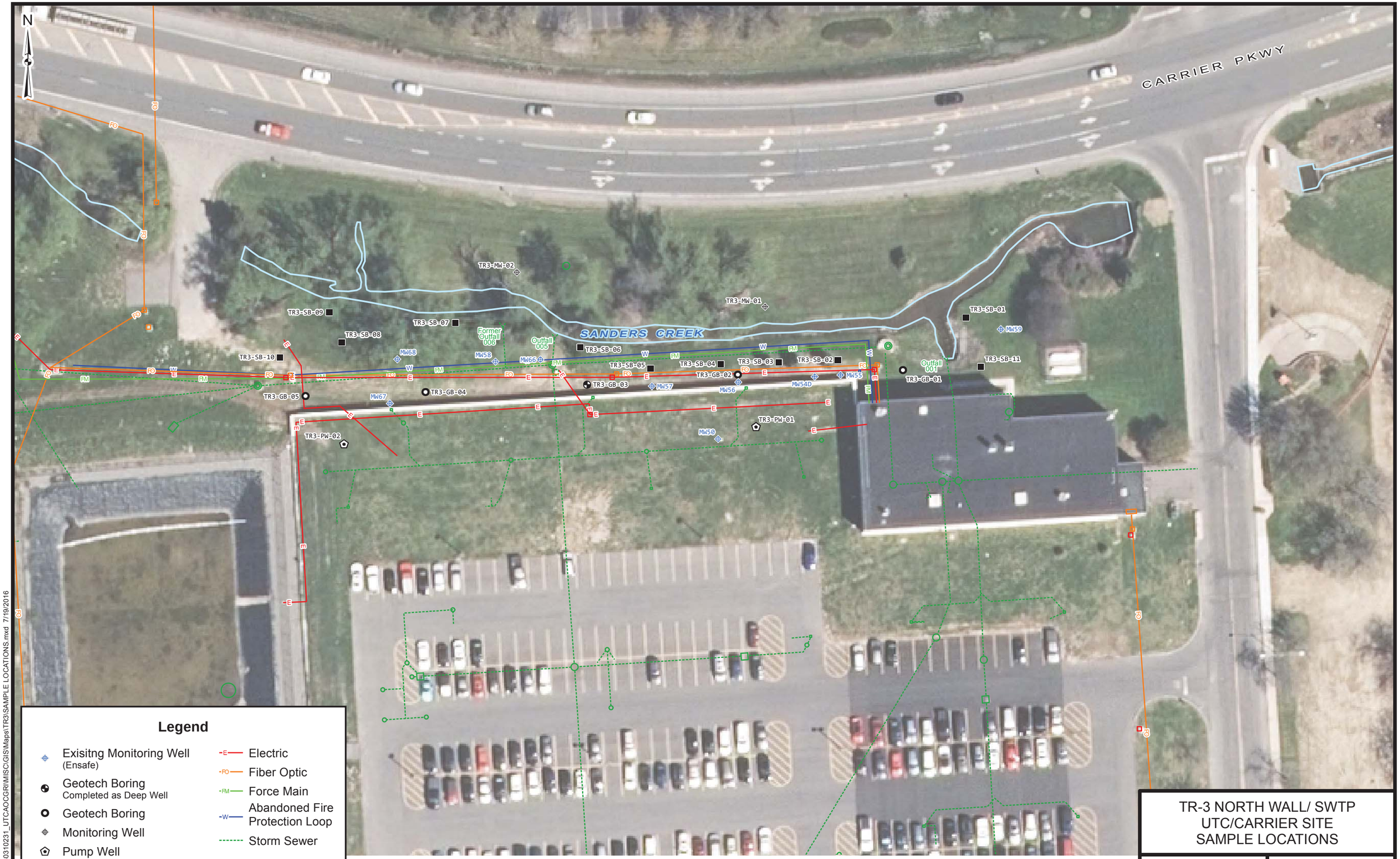
TR-3 NORTH WALL/SWTP
UTC/CARRIER SITE
EXISTING SITE CONDITIONS

AECOM

FIGURE 2

J:\Projects\60310231_UTCAOCGRI\Project Management\60487967-UTC.TR3Des\MISC\CAD\REPORT\FIGURE 2.dwg Layout1 1=1 7/19/2016-2 RAL

DRAFT



Legend

- Exisitng Monitoring Well (Ensafe)
- Geotech Boring Completed as Deep Well
- Geotech Boring
- Monitoring Well
- Pump Well
- Soil Boring
- Electric
- Fiber Optic
- Force Main
- Abandoned Fire Protection Loop
- Storm Sewer

SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

50 0 50 Feet

TR-3 NORTH WALL/ SWTP
UTC/CARRIER SITE
SAMPLE LOCATIONS

AECOM

FIGURE 3

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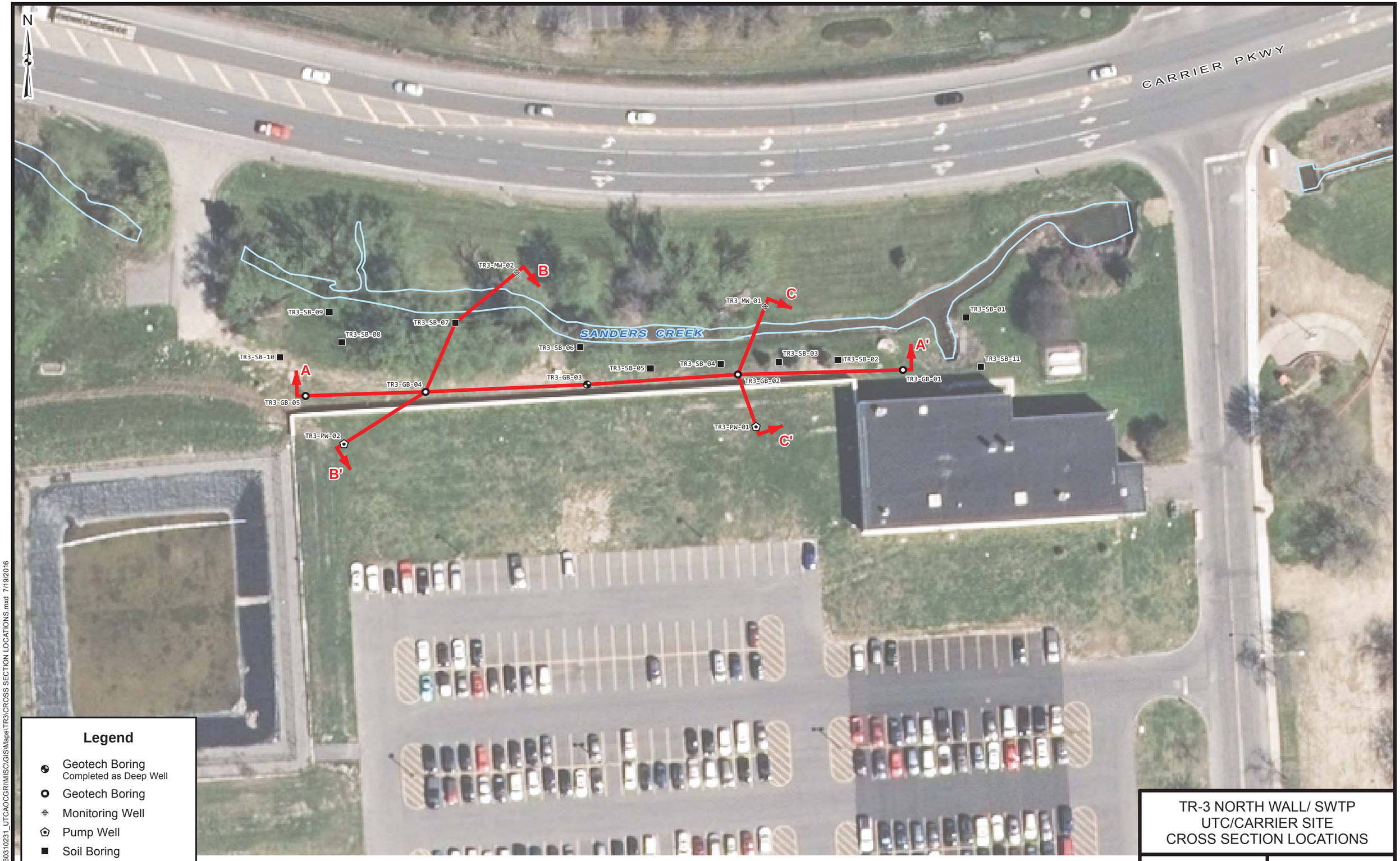
DRAFT



Legend

- Geotech Boring Completed as Deep Well
- Geotech Boring
- Monitoring Well
- Pump Well
- Soil Boring
- Cross Section Location

SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

50 0 50 Feet

TR-3 NORTH WALL/ SWTP
UTC/CARRIER SITE
CROSS SECTION LOCATIONS

AECOM

FIGURE 4

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\TR3\CROSS SECTION LOCATIONS.mxd 7/19/2016

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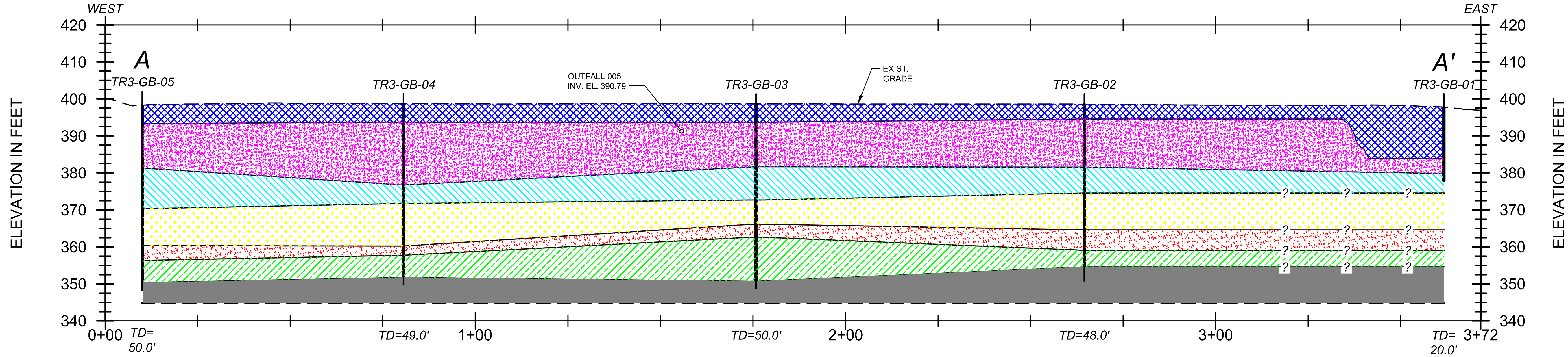
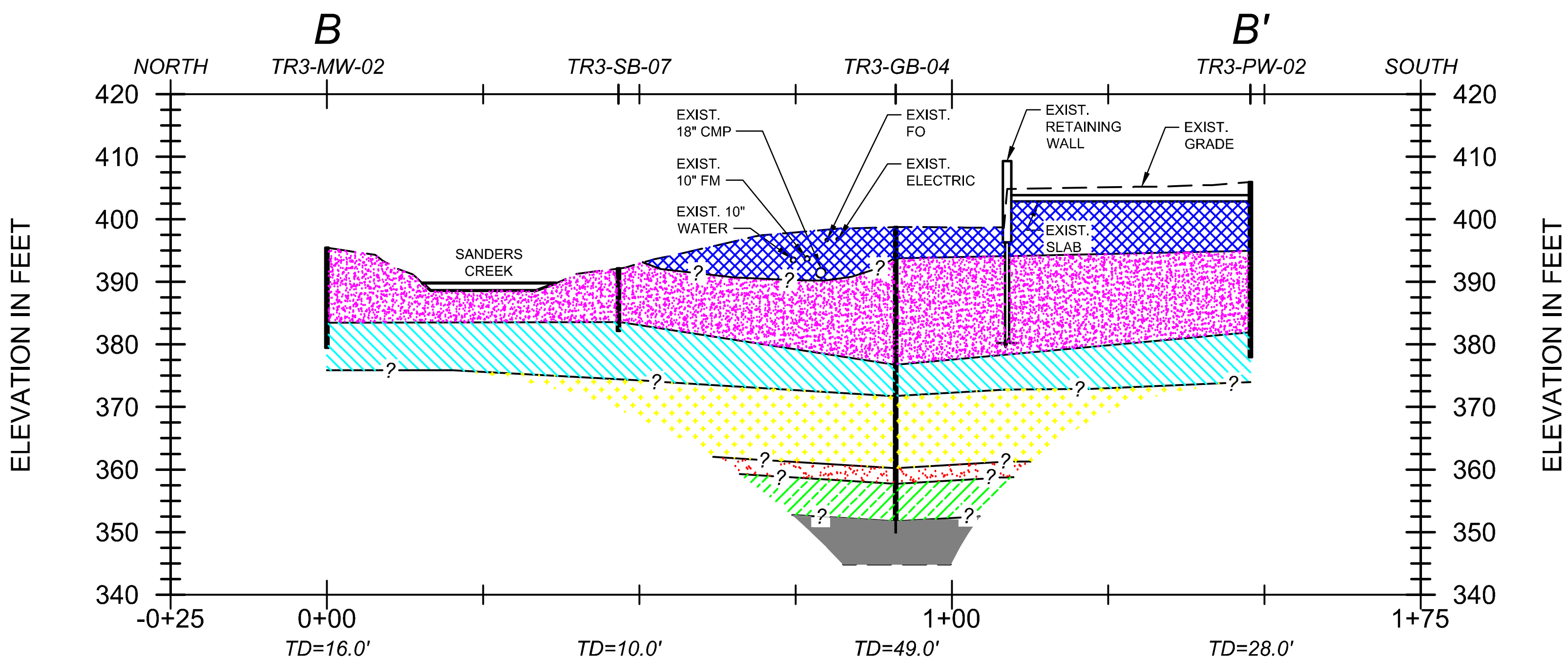


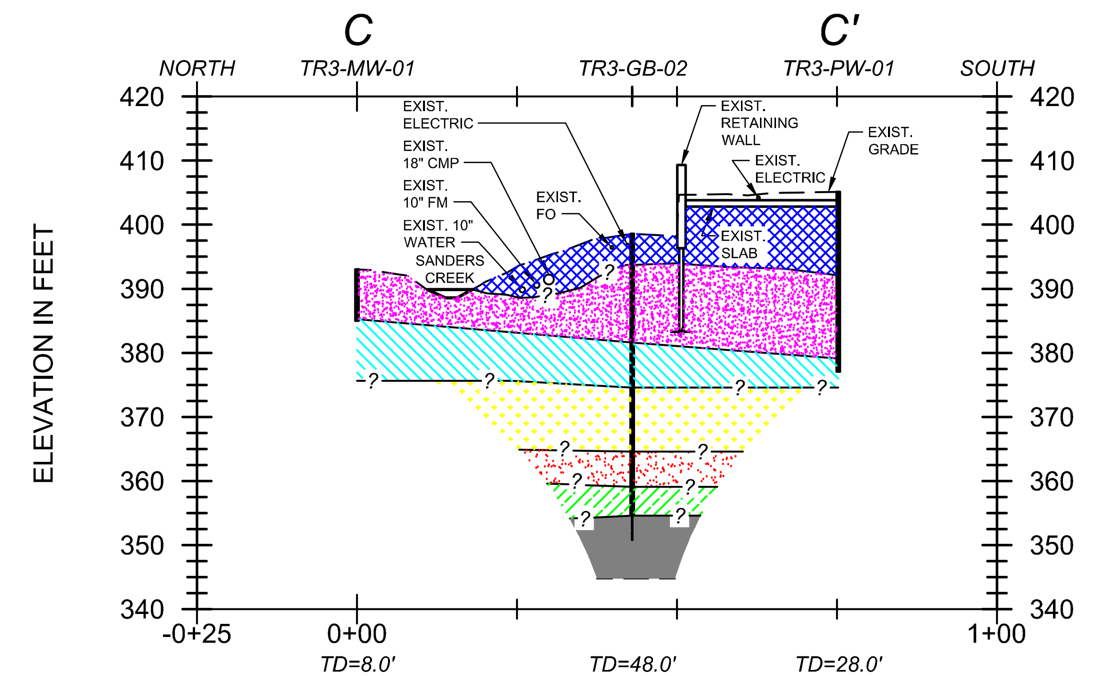
SECTION A-A'

SCALE: 1" = 30'-0"



SECTION B-B'

SCALE: 1" = 30'-0"



SECTION C-C'

SCALE: 1" = 30'-0"

LEGEND:

- FILL
- INTERLAYERED SILTY CLAY, CLAYEY SILT SOME SILTY SAND LAYERS
- GRAY CLAY
- CLAYEY SILT
- F-M SAND
- CLAYEY SILT w/OCCASIONAL SILTY CLAY AND SILTY SAND LAYERS
- SHALE BEDROCK

30' 0 30'

SCALE IN FEET

NOTE:

1. UTILITY LOCATIONS ARE APPROXIMATE.

TR-3 NORTH WALL/SWTP
UTC/CARRIER SITE
CROSS-SECTIONS A-A', B-B', & C-C'

AECOM

FIGURE 5

N

CARRIER PKWY

SANDERS CREEK

TR3-SB-07 (3' - 4')	CRIT	1/16
VOCs:		
1,2-Dichloroethene (cis)	250	757
Vinyl chloride	20	156

TR3-SB-07 (4' - 5')	CRIT	1/16
VOCs:		
1,2-Dichloroethene (cis)	250	10100
Trichloroethene	470	1460
Vinyl chloride	20	513

TR3-SB-07 (5.5' - 6.5')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	11800
Methyl ethyl ketone (2-Butanone)	120	1550
Trichloroethene	470	11300

TR3-SB-07 (9' - 10')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	48800
1,2-Dichloroethene (trans)	190	314
Trichloroethene	470	219000

TR3-GB-02 (7' - 9')	CRIT	1/16
No Exceedances		

TR3-GB-02 (13' - 15')	CRIT	1/16
VOCs:		
1,2-Dichloroethene (cis)	250	38600
Vinyl chloride	20	207

TR3-GB-02 (20' - 22')	CRIT	1/16
No Exceedances		

TR3-SB-04 (5' - 6.5')	CRIT	4/16
No Exceedances		

TR3-SB-04 (6.5' - 8')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	1000
Vinyl chloride	20	398

TR3-SB-04 (8.5' - 10.5')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	13700
Vinyl chloride	20	2240

TR3-SB-02 (8' - 10')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	414
Vinyl chloride	20	72.2

TR3-SB-02 (12' - 14')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	22200
Trichloroethene	470	225000

TR3-SB-02 (14' - 16')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	9160
Trichloroethene	470	292000

TR3-SB-01 (1' - 2')	CRIT	4/16
No Exceedances		

TR3-SB-01 (3' - 4')	CRIT	4/16
No Exceedances		

TR3-SB-01 (10' - 12')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	9260
Trichloroethene	470	197000

TR3-SB-10 (6' - 8')	CRIT	4/16
No Exceedances		

TR3-SB-10 (8' - 10')	CRIT	4/16
No Exceedances		

TR3-SB-10 (12' - 14')	CRIT	4/16
VOCs:		
Vinyl chloride	20	40.3

TR3-SB-11 (4' - 8')	CRIT	4/16
VOCs:		
1,2-Dichloroethene (cis)	250	287
Trichloroethene	470	514

TR3-SB-11 (8' - 12')	CRIT	4/16
No Exceedances		

TR3-SB-11 (13' - 14')	CRIT	4/16
No Exceedances		

MW66 (12' - 14')	CRIT	11/14
VOCs:		
1,2-Dichloroethene (cis)	250	44000
Trichloroethene	470	52000

TR3-GB-01 (6' - 8')	CRIT	1/16
No Exceedances		

TR3-GB-01 (16.8' - 17.2')	CRIT	1/16
VOCs:		
1,2-Dichloroethene (cis)	250	17600
Tetrachloroethene	1300	2970
Trichloroethene	470	1120000

TR3-PW-01 (14' - 16')	CRIT	1/16
No Exceedances		

TR3-PW-01 (24' - 26')	CRIT	1/16
VOCs:		
1,2-Dichloroethene (cis)	250	9610
Trichloroethene	470	250000

TR3-PW-01 (26' - 28')	CRIT	1/16
VOCs:		
1,2-Dichloroethene (cis)	250	11400
Tetrachloroethene	1300	3380
Trichloroethene	470	321000

TR3-SB-03 (6' - 8')	CRIT	4/16
No Exceedances		

TR3-SB-03 (8' - 10')	CRIT	4/16
VOCs:		
Vinyl chloride	20	86

TR3-SB-03 (12' - 14')	CRIT	4/16
VOCs:		
Vinyl chloride	20	41.7

TR3-MW-02
TR3-MW-01
TR3-SB-09
TR3-SB-08
Former Outfall 006
Outfall 005
Outfall 001
MW68
MW58
MW67
MW57
MW56
MW54D
MW55
MW59
MW50
TR3-GB-03
TR3-GB-04
TR3-GB-05
TR3-PW-02

Legend

- Existing Monitoring Well (Ensafe)
- Geotech Boring Completed as Deep Well
- Geotech Boring
- Monitoring Well
- Pump Well
- Soil Boring
- Storm Sewer

CRITERIA: 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, including CP-51 Table 1, Effective 12/2/10.
NOTES: Units shown in µg/kg; Acetone exceedances were excluded from the figure, as explained in the report. MW54D and MW68 analyzed for PCBs, ORO, & DRO only.
VOC samples from Ensafe borings were collected from above the water table only.
SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

50 0 50 Feet

TR-3 NORTH WALL/ SWTP
UTC/CARRIER SITE
SOIL EXCEEDANCES
PROTECTION OF GROUNDWATER SCOs
(JANUARY/APRIL 2016)

AECOM

FIGURE 6

J:\Projects\60310231_UTCAOCGRI\MtSC\GIS\Maps\TR3\SOIL ANALYTICAL RESULTS (JANUARY & APRIL 2016) - PG CRITERIA.mxd 7/19/2016

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CRITERIA: 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial.
NOTES: Units shown in µg/kg; Acetone exceedances were excluded from the figure, as explained in the report. MW54D and MW68 analyzed for PCBs, ORO, & DRO only.
VOC samples from Ensafe borings were collected from above the water table only.
SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

TR-3 NORTH WALL/ SWTP
UTC/CARRIER SITE
SOIL EXCEEDANCES
INDUSTRIAL SCOS
(JANUARY/APRIL 2016)

AECOM

FIGURE 7

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\TR3\SOIL ANALYTICAL RESULTS (JANUARY & APRIL 2016) - IND CRITERIA.mxd 7/19/2016

DRAFT

Legend

- Existing Monitoring Well (Ensafe)
- Geotech Boring Completed as Deep Well
- Monitoring Well
- Pumping Well

CRITERIA: NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including January 1999 Errata Sheet, April 2000 and June 2004 Addenda. Class GA
NOTES: Units shown in µg/L; Select Ensafe 2015 groundwater data is shown to provide supplemental data as discussed in the text
SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

50 0 50 Feet

TR-3 NORTH WALL/ SWTP UTC/CARRIER SITE GROUNDWATER EXCEEDANCES (JUNE 2015 & APRIL 2016)

AECOM

FIGURE 8

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\TR3\GROUNDWATER ANALYTICAL RESULTS (APRIL 2016).mxd 7/19/2016

DRAFT

N

CARRIER PKWY

SANDERS CREEK

TR3-MW-02
TR3-MW-01
TR3-SB-09
TR3-SB-07
TR3-SB-08
TR3-SB-10
TR3-SB-04
TR3-SB-03
TR3-SB-02
TR3-SB-01
TR3-SB-11
MW68
MW58
MW66
MW57
MW56
MW54D
MW55
MW59
TR3-GB-04
TR3-GB-05
TR3-GB-03
TR3-GB-02
TR3-GB-01
MW67
MW50
TR3-PW-02
TR3-PW-01

Legend

- Exisitng Monitoring Well (Ensafe)
- Geotech Boring Completed as Deep Well
- Geotech Boring
- Monitoring Well
- Pump Well
- Soil Boring
- Storm Sewer
- Area of Proposed Soil Remediation

SOURCE: NYS Digital Ortho-imagery Program (NYSDOP), Onondaga County, 2015

50 0 50 Feet

TR-3 NORTH WALL/ SWTP UTC/CARRIER SITE ESTIMATED AREAL EXTENT OF SOIL IMPACTS

AECOM

FIGURE 9

J:\Projects\60310231_UTCAOCGRI\MISC\GIS\Maps\TR3\PROPOSED REMEDIATION.mxd 7/26/2016

Appendix A
Boring/Well Construction Logs

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TEST BORING LOG

BORING NO. : TR3-GB-01

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60480273
NORTHING:	1124848.81 **EASTING:** 953773.57
GROUNDWATER:	
GROUND ELEVATION:	398.11
DATE STARTED:	1/12/16
DATE FINISHED:	1/26/16
DRILLER:	Mark Eaves
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4	Hand Clear	NA	ND	Brown SILT, some fine sand and fine gravel, trace cobble (Fill)		Moist
-5		4-6	5/6/10/7	40	ND	Brown fine to coarse SAND and GRAVEL (Fill)		
		6-8	7/6/6/5	40	ND			
		8-10	2/3/5/7	10	ND	Brown silty fine to coarse SAND, trace gravel (FILL)		Wet @ 8.0'
-10		10-12	2/2/5/7	10	ND	Brown silty fine SAND and fine to coarse angular GRAVEL (FILL)		
		12-14	5/2/2/2	5	ND	coarse sand @ 12.0-14.0		
-15		14-16	woh/woh woh/1	80	2301	Gray silty CLAY (CL)		
						Clayey SILT, trace fine sand (ML)		Solvent Odor
		16-18	2/5/6/5	100	156 >9999	Brownish Gray silty CLAY (CL) 17.0-17.1 - Silty fine sand seam		
-20		18-20	woh/woh woh/woh	100	20.2	Gray CLAY, soft, tacky (CL)		One droplet of brown NAPL on outside of 18-20' sample
						Boring terminated @ 20.0'		
-25								

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 20.0' bgs with CME-850 track mounted rig. Set 4' steel casing to 20.0'.

Soil samples from 6.0'-8.0' and 16.8'-17.2' were submitted for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-02

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 2
JOB NO. :	60480273
NORTHING:	1124846.05 **EASTING:** 953676.47
GROUND ELEVATION:	398.67
DATE STARTED:	1/11/16
DATE FINISHED:	1/28/16
DRILLER:	Mark Eaves
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	Split Spoon		
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-5	Hand Clear	NA	ND	Brown SILT and GRAVEL, trace clay (FILL)		
						Fine to coarse gravel (FILL)		
						Gray silty CLAY and GRAVEL (FILL)		
						Red brown silty fine SAND, some fine gravel (SM)		Moist
-5		5-7	2/2/4/4	25	ND	Red brown silty fine SAND, trace coarse sand and fine gravel (SM)		
		7-9	4/4/5/4	55	ND	Red brown fine SAND, trace coarse sand, occasional grey silty clay (SP)		
-10		9-11	3/3/4/4	70	6.2	Brownish gray clayey SILT to silty CLAY with roots, occasional black organic rich zones (ML)		Very Moist to Wet @ 9.0'
		11-13	4/5/5/5	100	18.2	Brownish gray silty CLAY, trace fine sand, small root mass (CL)		Wet @ 11.0'
		13-15	woh/woh 1/1	100	20.2	Gray very clayey SILT, trace fine sand, slightly plastic (ML) Occasional wood pieces to 14.0'		
						Gray very clayey fine SAND, slightly plastic (SP)		
-15		15-17	woh/woh 3/5	100	2.5	Dark gray very clayey SILT, slightly plastic (ML)		
						Gray silty CLAY (CL)		
		17-19	woh/3 3/4	100	0.8	Gray CLAY, trace silt, tacky (CL)		
-20		20-22	woh/woh woh/woh	100	ND	Gray CLAY, tacky (CL)		
		22-24	Shelby Tube	100	ND	Gray CLAY (CL)		
-25		24-26	2/2/2/2	50	ND	Gray to brownish gray CLAY with occasional thin silt partings (CL)		
						Clayey SILT, dilatent (ML)		

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 19.0' bgs with CME-850 track mounted rig. Set 4" steel casing to 19'. Advanced boring from 19' to 48' using mud rotary. Soil samples from 7'-9', 13'-15', and 20'-22' were submitted for analysis of VOC's & PCB's. Shelby tube from 22'-24' submitted for water content, Atterberg limits, and UU triaxial compression. Soil samples from 32'-34', 36'-38', 38'-39.5' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-02

PROJECT/PROJECT LOCATION: UTC TR3 North Wall

SHEET: 2 **OF** 2

CLIENT: UTC

JOB NO. : 60480273

BORING CONTRACTOR: Parratt-Wolff

NORTHING: 1124846.05 **EASTING:** 953676.47

GROUNDWATER:

GROUND ELEVATION: 398.67

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		
				* POCKET PENETROMETER READING				

DATE STARTED: 1/11/16

DATE FINISHED: 1/28/16

DRILLER: Mark Eaves

GEOLOGIST: R. Murphy

REVIEWED BY: K. Connare

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
		26-28	2/3/3/4	55	ND	Brownish gray clayey SILT, trace fine to very fine sand, dilatent (ML)		
		28-30	1/2/1/2	90	ND	Brownish gray clayey SILT, trace fine sand, dilatant (ML)		
-30		30-32	1/woh 1/woh	80	ND	Brown gray clayey SILT, trace fine sand, dilatant (ML)		
		32-34	1/4/2/4	90	ND			
		34-36	2/4/4/5	45	ND	Red brown fine SAND, trace medium sand (SM)		
-35		36-38	3/4/4/5	60	ND	Red brown fine to medium SAND, trace fine angular gravel, trace coarse sand (SP)		
		38-40	2/3/3/15	85	ND	Brown fine to medium SAND (SP)		
						Red-brown silty CLAY, some medium to coarse sand (CL)		
-40		40-42	12/14/14/16	60	ND	Red brown silty CLAY, some coarse sand. trace fine gravel (CL)		Moist
						Yellow-brown silty SAND, some fine gravel, trace clay (SM)		Moist to Wet @ 41.0'
		42-44	19/21 50 per 0.4'	60	ND	42-44 - some weathered green shale pieces		Very Moist
-45		44-46	50 per 0.4'	100	ND	Red brown weathered SHALE with highly weathered green shale interbedding		
		46-48	50 per 0.4'	100	ND			
						Boring terminated @ 48.0'		
-50								

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 19.0' bgs with CME-850 track mounted rig. Set 4" steel casing to 19'. Advanced boring from 19' to 48' using mud rotary. Soil samples from 7'-9', 13'-15', and 20'-22' were submitted for analysis of VOC's & PCB's. Shelby tube from 22'-24' submitted for water content, Atterberg limits, and UU triaxial compression. Soil samples from 32'-34', 36'-38', 38'-39.5' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-03

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 2
JOB NO. :	60480273
NORTHING:	1124840.16 **EASTING:** 953587.98
GROUNDWATER:	
GROUND ELEVATION:	398.49
DATE STARTED:	1/11/16
DATE FINISHED:	1/27/16
DRILLER:	Mark Eaves
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-5	Hand Auger	NA	ND	Brown SILT and GRAVEL, trace to some clay (Fill)		
						Brown clayey SILT to silty CLAY (Fill)		Moist
						Gray silty CLAY, trace coarse sand and fine gravel, soft, moderate plasticity (Fill) @4.0'-5.0' - Some gravel		
-5		5-7	woh/woh woh/2	30	ND	Gray silty CLAY, some fine to coarse gravel (CL)		
		7-9	2/3/3/4	40	ND	Gray brown silty CLAY, some coarse sand, trace fine gravel (CL)		
-10		9-11	woh/woh 2/2	35	ND	Gray fine sandy SILT with peat and wood layers (ML)	Cement Bentonite Grout	Wet @ 9.0'
		11-13	2/2/3/2	100	ND	Gray clayey SILT, occasional wood fragments, trace fine sand (ML)	4" Steel Casing (0-19')	
		13-15	woh/woh woh/4	100	ND	Gray clayey SILT, occasional wood fragments (ML) Gray silty CLAY (CL)	Cement Bentonite Grout	
-15		15-17	2/2/6/5	75	ND	Gray silty fine SAND (SM) Gray silty CLAY, very plastic (CL)		Moist to Wet
		17-19	6/6/5/5	100	ND	Gray CLAY (CL) 18.2-18.25 - silty clay partings	2" PVC Riser (0-34')	Wet @ 17.0'
-20		20-22	Shelby Tube	0	NA	No Recovery		
		22-24	Shelby Tube	100	ND	Gray CLAY (CL)		
-25		24-26	Shelby Tube	90	ND	Gray clayey SILT (ML)		

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 19.0' bgs with CME-850 track mounted rig. Set 4" steel casing to 19.0'. Advanced from 19.0' bgs to 50.0' bgs using mud rotary. Soil samples from 7'-9', 9'-11', and 11'-13' were submitted for analysis of VOCs & PCBs. Shelby tubes from 22'-24' and 24'-26' submitted for water content, Atterberg limits, and UU triaxial compression. Soil samples from 30'-32', 32.5'-34', and 34'-36' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-03

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall							**SHEET:** 2 **OF** 2	
CLIENT:	UTC							**JOB NO. :** 60480273	
BORING CONTRACTOR:	Parratt-Wolff							**NORTHING:** 1124840.16	**EASTING:** 953587.98
GROUNDWATER:					**CAS.**	**SAMPLER**	**CORE**	**TUBE**	**GROUND ELEVATION:** 398.49
DATE	**TIME**	**LEVEL**	**TYPE**	**TYPE**	HSA	Split Spoon			**DATE STARTED:** 1/11/16
				DIA.	6 1/4"	2"			**DATE FINISHED:** 1/27/16
				WT.		140 lbs.			**DRILLER:** Mark Eaves
				FALL		30"			**GEOLOGIST:** R. Murphy
				* POCKET PENETROMETER READING					**REVIEWED BY:** K. Connare

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
-30		26-28	2/2/4/4	80	ND	Brownish gray SILT, some clay, dilatant (ML)	Bentonite Slurry (27'-31')	
		28-30	2/1/1/2	70	ND			
		30-32	2/2/2/3	75	ND	SILT, trace clay, trace very fine sand, dilatant (ML)	Bentonite Chip Seal (31'-32')	
		32-34	3/7/7/8	70	ND	Brown to red brown fine to medium SAND, trace silt (SP)		
-35		34-36	5/5/5/4	55	ND	Red brown fine to medium SAND (SP)		
		36-38	5/17/21/36	15	ND	Red brown silty CLAY with medium to coarse SAND and fine GRAVEL (CL)		
		38-40	50 per 0.4'	100	ND	Red brown clayey SILT with trace coarse sand, little weathered red shale, till (ML)		Dry to moist
-40		40-42	27/31 50 per 0.4'	25	ND	Clayey SILT, some red shale, trace mica flakes (ML)	NJ #0 US Silica (32'-50')	
		42-44	10/10/17/17	60	ND	SHALE and fine GRAVEL, some coarse sand (GM) 42.5-23.5 - Greenish gray clayey silt layer	10-slot 2" PVC screen (34'-50')	Very Moist to Wet
-45		44-46	12/12/16/17	65	ND	Red brown clayey SILT, some red to green shale gravel, trace mica (ML)		Moist
		46-48	50 per 0.4'	100	ND	Clayey SILT with red and green shale fragments, some gravel and coarse sand (ML)		
		48-50	50 per 0.3'	100	ND	Weathered interbedded red and green gray SHALE bedrock		
-50						Boring terminated @ 50.0'		

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 19.0' bgs with CME-850 track mounted rig. Set 4" steel casing to 19.0'. Advanced from 19.0' bgs to 50.0' bgs using mud rotary. Soil samples from 7'-9', 9'-11', and 11'-13' were submitted for analysis of VOCs & PCBs. Shelby tubes from 22'-24' and 24'-26' submitted for water content, Atterberg limits, and UU triaxial compression. Soil samples from 30'-32', 32.5'-34', and 34'-36' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-04

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 2
JOB NO. :	60480273
NORTHING:	1124835.91 **EASTING:** 953492.85
GROUNDWATER:	
GROUND ELEVATION:	399.24
DATE STARTED:	1/11/16
DATE FINISHED:	1/22/16
DRILLER:	Mark Eaves
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	Split Spoon		
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-5	Hand Auger	NA	ND	Gray to brown clayey SILT, some to trace gravel (Fill) Brown clayey SILT, some gravel (Fill) Gray clayey SILT, some fine gravel (Fill) @3.0'-5.0' - trace wood & roots		
-5		5-7	woh/woh woh/2	25	ND	Brown silty CLAY, some fine gravel (CL)		Moist
		7-9	3/4/3/4	0	ND	No Recovery		
-10		9-11	woh/woh woh/1	55	ND	Gray-brown clayey SILT (ML) @10.0' - Peat/wood		Wet @ 9.0'
		11-13	1/1/1/1	100	ND	Gray to brown SILT to clayey SILT with interbedded peat layers, occasional fine sand (ML)		
		13-15	woh/woh woh/woh	100	ND	Gray to brown silty CLAY (CL) Brown SILT to fine sandy SILT (ML)		
-15		15-17	woh/woh 3/3	80	ND	Brown clayey SILT with silty fine sand interbeds (ML)		
		17-19	3/4/3/4	100	ND	Brown silty CLAY with interbedded silty fine sand (CL) Gray-brown CLAY, non-plastic, tacky (CL)		
-20		19-21	woh/woh woh/woh	100	ND	Gray-brown CLAY, trace silt (CL)		
		21-23	woh/woh woh/woh	100	ND	Gray CLAY, tacky (CL)		
		23-25	Shelby Tube	100	ND			
-25								

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 21.0' bgs using CME-850 track mounted rig. Set 4" steel casing to 20.0' Advanced from 21.0' bgs to 49.0' bgs using mud rotary. Soil samples from 9'-11', 11'-13', 13'-15' submitted for analysis of VOCs & PCBs. Shelby tube 23'-25' submitted for water content, and Atterberg limits. Soil samples from 37'-38.5', 38.5'-39', and 39'-40.5' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-04

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall							**SHEET:** 2 **OF** 2	
CLIENT:	UTC							**JOB NO. :** 60480273	
BORING CONTRACTOR:	Parratt-Wolff							**NORTHING:** 1124835.91	**EASTING:** 953492.85
GROUNDWATER:					**CAS.**	**SAMPLER**	**CORE**	**TUBE**	**GROUND ELEVATION:** 399.24
DATE	**TIME**	**LEVEL**	**TYPE**	**TYPE**	HSA	Split Spoon			**DATE STARTED:** 1/11/16
				DIA.	6 1/4"	2"			**DATE FINISHED:** 1/22/16
				WT.		140 lbs.			**DRILLER:** Mark Eaves
				FALL		30"			**GEOLOGIST:** R. Murphy
				*** POCKET PENETROMETER READING**					**REVIEWED BY:** K. Connare

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
-25		25-27	woh/woh woh/woh	100	ND	Gray CLAY (CL)		
		27-29	5/5/6/7	100	ND	Gray silty CLAY with thin silt interbeds (CL)		
						Brown gray clayey SILT (ML)		
-30		29-31	5/5/4/4	90	ND	Gray brown clayey SILT, dilatent (ML)		
		31-33	woh/woh 2/2	50	ND	Brown gray clayey SILT, mostly silt 32.5-33, dilatant (ML)		
		33-35	2/4/5/4	75	ND	Brown gray SILT, some clay, trace sand dilatant (ML)		
-35		35-37	2/3/4/5	75	ND			
		37-39	5/5/7/12	65	ND	Brown gray clayey SILT, trace fine sand, dilatant (ML)		
						Brown fine to medium SAND, trace silt, dilatant (SP)		
-40		39-41	5/8/11/8	50	ND	Brown fine to medium SAND (SP)		
						Light brown clayey fine SAND, trace round fine gravel (SC)		
		41-43	12/18 37/50 per 0.4'	65	ND	Red brown clayey SILT, trace coarse gravel, till (ML) weathered shale @ 42.5		Dry to moist
		43-45	41/50 per 0.4'	100	ND	Red brown clayey SILT, trace coarse sand, till (ML)		
-45		45-47	18/18 31/50 per 0.3'	55	ND	Red brown clayey SILT, red shale pieces, trace coarse sand (ML)		
		47-49	20/12 20/50 per 0.4'	68	ND	Red brown very weathered bedrock. Competent green-grey shale bedrock starts at 48.5'.		
-50						Boring terminated @ 49.0'		

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 21.0' bgs using CME-850 track mounted rig. Set 4" steel casing to 20.0' Advanced from 21.0' bgs to 49.0' bgs using mud rotary. Soil samples from 9'-11', 11'-13', 13'-15' submitted for analysis of VOCs & PCBs. Shelby tube 23'-25' submitted for water content, and Atterberg limits. Soil samples from 37'-38.5', 38.5'-39', and 39'-40.5' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-05

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 2
JOB NO. :	60480273
NORTHING:	1124833.63 **EASTING:** 953422.30
GROUND ELEVATION:	398.12
DATE STARTED:	1/11/16
DATE FINISHED:	1/21/16
DRILLER:	Mark Eaves
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-5	Hand Auger	NA	ND	Brown clayey silt, some gravel, trace asphalt & brick (FILL)		
						Brown-gray clayey silt, trace gravel (FILL)		Moist
-5		5-7	1/1/1/1	35	ND	Gray-brown silty CLAY, some coarse to fine sand, trace fine gravel (CL)		
		7-9	2/2/3/4	40	ND	Gray-brown silty CLAY (CL)		
-10		9-11	2/2/2/2	75	ND	Gray CLAY and SILT (CL/ML) Brown @ 10.5'-11.0'		Very moist to Wet
		11-13	1/1/2/3	100	ND	11.0' - 12.0' - Gray silty CLAY (CL)		
		13-15	woh/woh 2/3	100	ND	Brown Clayey SILT (ML) -Brown silty fine SAND seam 12.0-12.1' -Gray from 13-14'		Wet @ 12.0'
-15		15-17	woh/1 1/1	70	ND	Gray brown silty CLAY (CL) Gray CLAY with occasional silt partings (CL)		
		17-19	1/2/2/3	100	ND	Gray CLAY (CL)		
-20		20-22	Shelby Tube	100	ND			
		22-24	woh/woh 2/2	100	ND	Gray CLAY, trace silt (CL)		
-25		24-26	woh/woh woh/woh	5	ND	Brownish gray CLAY (CL)		
		26-28	woh/woh woh/woh	100	ND			
		28-30	4/8/8/8	85	ND	Brownish gray CLAY and SILT, dilatent, low plasticity (CL/ML)		
-30								

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 19.0' bgs with CME-850 track mounted rig using HSA. Set 4" steel casing Advanced from 19.0' bgs to 50.0' bgs using mud rotary. Soil samples from 5'-7', 7'-9', and 15'-17' were submitted for an of VOCs & PCBs. Shelby tube from 20-22 submitted for water content, Atterberg limits, and UU triaxial compression. Soil samples from 38'-39', 39'-40' and 40'-42' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-GB-05

PROJECT/PROJECT LOCATION: UTC TR3 North Wall
SHEET: 2 **OF** 2
CLIENT: UTC
JOB NO. : 60480273
BORING CONTRACTOR: Parratt-Wolff
NORTHING: 1124833.63 **EASTING:** 953422.30
GROUNDWATER:
GROUND ELEVATION: 398.12

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	Split Spoon		
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		
				* POCKET PENETROMETER READING				

DATE STARTED: 1/11/16
DATE FINISHED: 1/21/16
DRILLER: Mark Eaves
GEOLOGIST: R. Murphy
REVIEWED BY: K. Connare

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
-30		30-32	5/4/4/4	75	ND	Brownish gray clayey SILT, trace very fine sand (ML)		
		32-34	4/4/3/4	75	ND	Gray brown clayey SILT (ML)		
-35		34-36	3/3/4/5	85	ND	Gray brown clayey SILT to clayey fine sandy SILT (ML)		
		36-38	4/4/6/8	80	ND	Brown fine SAND (SP)		
		38-40	4/3/2/6	75	ND	Brown gray silty fine SAND (SM)		
-40						Brown fine to medium SAND, trace silt (SP)		
		40-42	3/4/6/7	100	ND	Gray brown fine to medium SAND, trace coarse sand (SP)		
						Brown fine SAND, trace silt (SP)		
		42-44	10/36 50 per 0.3'	100	ND	Gray silty CLAY, trace coarse sand, trace fine gravel with red shale fragments (CL)		
-45		44-46	7/50 per 0.4'	100	ND	Red brown silty fine to medium SAND, trace coarse sand and fine rounded gravel. (SM)		
		46-48	50 per 0.3'	100	ND	Clayey SILT with red brown weathered shale fragments (ML)		
		48-50	50 per 0.2'	100	ND	Greenish gray SHALE with red-brown between layers		
-50						Boring terminated @ 50.0'		
-55								
-60								

COMMENTS: Boring hand cleared to 5.0' bgs then advanced to 19.0' bgs with CME-850 track mounted rig using HSA. Set 4" steel casing Advanced from 19.0' bgs to 50.0' bgs using mud rotary. Soil samples from 5'-7', 7'-9', and 15'-17' were submitted for an of VOCs & PCBs. Shelby tube from 20-22 submitted for water content, Atterberg limits, and UU triaxial compression. Soil samples from 38'-39', 39'-40' and 40'-42' submitted for grain size analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-MW-01

PROJECT/PROJECT LOCATION: UTC TR3 North Wall PDI	**SHEET:** 1 **OF** 1
CLIENT: UTC	**JOB NO. :** 60428933
BORING CONTRACTOR: Parratt-Wolff	**NORTHING:** 1124885.97 **EASTING:** 953692.42
GROUNDWATER:	**GROUND ELEVATION:** 393.19

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	Macrocore		
				DIA.	4 1/4	2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED:	1/12/16
DATE FINISHED:	4/8/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT	Bentonite (0.5-1.5')	
						Gray Clayey SILT, trace fine gravel		
						Gray Silty CLAY	2" PVC Riser (0'-2')	Very moist
						Gray Clayey SILT, trace fine gravel		Wet @ 3.0'
-5		4-8		100	ND	Gray silty very fine SAND	NJ #0 US Silica (1.5'-8')	
						Gray Clayey SILT, trace fine sand, with brown laminations.	10-slot 2" PVC screen (2'-8')	
						Gray Silty fine SAND to Fine Sandy SILT		
						Gray CLAY		
-10						End of boring @ 8.0'		
-15								
-20								
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 2.0'-3.0', 3.0'-4.0', and 4.0'-5.0' for analysis of VOCs and PCBs

Monitoring well was installed after soil sampling was completed by advancing 4 1/4 HSAs.

AECOM

TEST BORING LOG

BORING NO. : TR3-MW-02

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124906.18 **EASTING:** 953546.57
GROUND ELEVATION:	395.73
DATE STARTED:	1/12/16
DATE FINISHED:	4/8/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	Macrocore		
				DIA.	4 1/4	2"		
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT, trace gravel	Bentonite (0.5-1.5')	moist
						Brown gray Clayey SILT to Silty CLAY, slightly plastic with occassional silt partings.	2" PVC Riser (0'-2')	Wet @ 4.0'
-5		4-8		55	ND	Brown Silty fine SAND		
						Gray to brown gray Silty CLAY		
						-silty fine sand seam 7-7.5'	NJ #0 US Silica (1.5'-12')	
-10		8-12		55	ND	Gray to brown gray Silty very fine SAND, some clay	10-slot 2" PVC screen (2'-12')	
		12-16		100	ND	Gray CLAY, thin silt seam at 12.4'		
-15							Natural Collapse	
-20						End of boring @ 16.0'		
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 3.0'-4.0', 4.0'-5.0', and 7.0'-7.5' for analysis of VOCs and PCBs

Monitoring well was installed after soil sampling was completed by advancing 4 1/4 HSAs.

AECOM

TEST BORING LOG

BORING NO. : TR3-PW-01

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60480273
NORTHING:	1124815.67 **EASTING:** 953687.16
GROUND ELEVATION:	405.38
DATE STARTED:	1/11/16
DATE FINISHED:	1/14/16
DRILLER:	Mark Eaves
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE	HSA	Split Spoon		
DIA.	6 1/4"	2"		
WT.		140 lbs.		
FALL		30"		

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-1.8	Hand Auger	NA	ND	Brown clayey SILT, trace gravel (FILL)		Moist
		1.8-4	Auger	NA	ND	Concrete Slab Dense aggregate (FILL)		
-5		4-6	23/14/12/8	25	ND	Red-brown fine SAND, trace coarse sand, some fine subrounded gravel (Fill)		
		6-8	7/5/7/7	25	ND	trace silt @ 6.0'	Bentonite (0-11') 4" PVC Riser (0'-13')	
		8-10	3/2/2/2	75	ND	Red-brown fine SAND, trace coarse sand, trace silt (Fill)		
-10		10-12	6/5/5/3	0	ND	10'-12' - No Recovery		
		12-14	4/4/7/7	65	ND			
						Gray silty CLAY (CL)		
-15		14-16	1/1/3/3	75	ND	Gray clayey SILT, low plasticity (ML/CL)		
		16-18	3/2/3/4	100	0.9 ppm @ 17.5	Dark gray clayey SILT to silty CLAY. Moderate plasticity (ML/CL)		Wet @ 16.5'
		18-20	2/2/3/5	80	15.0 ppm	Gray silty CLAY (CL) @19.5 - Gray SILT to Fine Sandy SILT, dilatant		
-20		20-22	4/4/3/3	50	98.8 ppm	Grey clayey SILT with moderate plasticity. Occasional fine sandy partings. (ML/CL)	NJ #0 US Silica (11'-28')	
		22-24	4/3/4/2	75	134 ppm	Silty Clay partings @ 22.0'	10-slot 4" PVC screen (13'-28')	
-25		24-26	2/2/2/2	40	367 ppm	Gray CLAY and SILT (ML/CL)		
		26-28	2/2/2/2	100	34.4 ppm	Gray CLAY (CL)		
						Boring terminated @ 28.0'		

COMMENTS: Boring hand cleared to 1.8' bgs then advanced with CME-75 truck mounted rig. Soil samples collected from 14'-16', 24'-26', and 26'-28' and submitted for analysis of VOCs & PCBs.

BORING NO. : TR3-PW-01

AECOM

TEST BORING LOG

BORING NO. : TR3-PW-02

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60480273
NORTHING:	1124805.52 **EASTING:** 953444.97
GROUND ELEVATION:	406.14
DATE STARTED:	1/11/16
DATE FINISHED:	1/15/16
DRILLER:	Mark Eaves
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
				DIA.	6 1/4"	2"		
				WT.		140 lbs.		
				FALL		30"		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-2.8	Hand Auger	NA	ND	Gray clayey SILT, trace gravel (FILL) Brown @ 1.8'	Sand/ Backfill (0.5-4')	Moist
		2.8-4	HSAs	NA	ND	Concrete Slab		
-5		4-6	4/9/9/10	50	ND	Brown to gray sandy gravel, some silt (FILL)	4" PVC Riser (0'-13')	
		6-8	7/7/9/9	100	ND	Brown silty CLAY, some fine sand, low plasticity (Fill)	Bentonite Seal (4'-9')	
		8-10	5/4/5/4	50	ND	Brown silty CLAY, trace coarse sand, slight plasticity (Fill)		
-10		10-12	6/7/8/7	20	ND	Brown silty CLAY, trace coarse to fine sand and fine gravel, moderate plasticity (Fill)		Wet @ 10.0'
		12-14	7/12/50-0.2	50	ND	Concrete		
-15		14-16	2/2/2/4	50	ND	Brownish gray plastic silty CLAY (CL)		
		16-18	4/5/4/4	100	ND	Trace wood/organic layer @ 17.5'	NJ #0 US Silica (9'-26')	
		18-20	5/4/5/9	70	ND	Gray brown to brownish gray plastic silty CLAY. (CL)	10-slot 4" PVC screen (11'-26')	
-20		20-22	5/5/7/8	75	ND			
		22-24	8/7/7/7	65	ND	Brown and gray dilatant SILT to fine sandy silt (ML)		
-25		24-26	2/2/1/1	100	ND	Brownish gray CLAY, non plastic (CL)		
		26-28	woh/woh woh/woh	100	ND		Natural Collapse (sampled only)	
						Boring terminated @ 28.0'		

COMMENTS: Boring hand cleared to 2.8' bgs then advanced with CME-75 truck mounted rig. Soil samples collected from 14'-16', and 23.5'-24' were submitted for analysis of VOCs & PCBs.

BORING NO. : TR3-PW-02

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-01

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124879.54 **EASTING:** 953810.60
GROUND ELEVATION:	392.80
DATE STARTED:	4/14/16
DATE FINISHED:	4/14/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown CLAY and SILT, trace gravel		Moist
					ND	Gray brown silty CLAY to clayey SILT		
					0.6	Gray brown clayey SILT, trace sand		Wet @ 2.5'
-5		4-8		90	1.4	Brown gray clayey SILT to silty CLAY		
						Silty fine SAND, some clay		
		8-10		75	0.5	Gray silty CLAY with fine sand		
-10		10-12		100	2.4	Gray CLAY		
						End of boring @ 12.0'		
-15								
-20								
-25								

COMMENTS: Boring hand cleared to 4.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 1.0'-2.0', 3.0'-4.0', and 10.0'-12.0' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-02

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124854.65 **EASTING:** 953735.42
GROUND ELEVATION:	397.38
DATE STARTED:	1/11/16
DATE FINISHED:	4/11/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT, some fine-coarse gravel, trace cobble		
-5		4-8		25	ND	Gray-brown silty CLAY, trace fine sand and gravel		
-10		8-12		72.5	ND	Gray clayey SILT with organics		Moist
					2.4	Brown-gray clayey SILT, trace fine sand		Wet @ 10.0'
-15		12-16		60	3.2	Gray silty CLAY with brown silty laminations		
					2.6	Gray CLAY		Very moist to wet @ 14.0'
-20						End of boring @ 16.0'		
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 8.0'-10.0', 12.0'-14.0', and 14.0'-16.0' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-03

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124853.45 **EASTING:** 953700.64
GROUND ELEVATION:	397.39
DATE STARTED:	1/11/16
DATE FINISHED:	4/11/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT, trace coarse SAND and fine-coarse gravel		Damp to moist
-5		4-8		60	ND	Gray silty CLAY, trace coarse sand and fine gravel, moderate plasticity		Moist
						Brown clayey SILT		
						Gray to brown gray clayey SILT		Very moist to wet @ 6.0'
-10		8-12		85	ND	Gray-brown silty fine SAND with wood fragments		
						Brown-gray clayey SILT, some fine sand		Wet
						Gray clayey SILT		
		12-16		100	ND	Brown SILT and fine SAND, some clay		
						Gray silty CLAY with brown laminations		Wet
-15						Gray CLAY		
-20						End of boring @ 16.0'		
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 6.0'-8.0', 8.0'-10.0', and 12.0'-14.0' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-04

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124852.34 **EASTING:** 953666.39
GROUND ELEVATION:	397.31
DATE STARTED:	1/11/16
DATE FINISHED:	4/11/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE		Macrocore		
DIA.		2"		
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT to silty CLAY and GRAVEL, trace brick and concrete		
-5		4-8		50	ND	Brown-gray clayey SILT		Soft 4.0'-5.0' Very moist
						Gray-brown SILT, some fine sand		Wet @ 6.5'
-10		8-12		85	ND	Brown-gray silty CLAY with thin fine sandy partings		
		12-16		90	ND	Gray silty CLAY		
-15						Gray CLAY		
-20						End of boring @ 16.0'		
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 5.0'-6.5', 6.5'-8.0', and 8.5'-10.5' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-05

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124849.63 **EASTING:** 953625.11
GROUND ELEVATION:	397.26
DATE STARTED:	1/11/16
DATE FINISHED:	4/11/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4.5			ND	Brown clayey SILT, trace coarse sand		
						Brown clayey SILT, trace coarse sand and fine gravel, occasional cobble		Refusal @ 4.5'
-5						End of boring @ 4.5' Hand Auger Refusal on concrete.		
-10								
-15								
-20								
-25								

COMMENTS: Boring hand cleared to refusal at 4.5'. Attempted to advance with track mounted 6712DT Geoprobe rig.

Concrete encountered with hand methods was confirmed to be competent with probe.

Attempted offset boring 1 foot away and refusal was also encountered at similar depth.

No samples were collected for analysis from this boring.

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-06

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124862.17 **EASTING:** 953583.69
GROUND ELEVATION:	Not surveyed
DATE STARTED:	1/11/16
DATE FINISHED:	4/11/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-5			ND	Brown silty CLAY, trace cobble, trace to some fine gravel		
-5						End of boring @ 5.0'		
-10								
-15								
-20								
-25								

COMMENTS: Boring hand cleared to 5.0'. Boring not completed due to unsafe slope.

No samples were collected for laboratory analysis.

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-07

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124876.60 **EASTING:** 953510.47
GROUND ELEVATION:	393.04
DATE STARTED:	1/11/16
DATE FINISHED:	4/14/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-5			ND	Brown organic clayey SILT, abundant root mass		
						Brown-gray clayey SILT to silty CLAY		Very moist
						Gray clayey SILT to silty CLAY, moderate plasticity		Wet @ 4.0'
-5		5-8		100	3.8	Gray-brown clayey SILT		
					24.5	Gray-brown silty fine SAND		
					6.9	Brownish-gray clayey SILT, silty fine sand seam @ 7.0'-7.1'		
		8-10		100	4.3			Tacky
					2.7	Gray CLAY		
-10						End of boring @ 10.0'		
-15								
-20								
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 3.0'-4.0', 4.0'-5.0', 5.5'-6.5' and 9.0'-10.0' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-08

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124865.07 **EASTING:** 953443.60
GROUND ELEVATION:	396.17
DATE STARTED:	1/11/16
DATE FINISHED:	4/11/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE		Macrocore		
DIA.		2"		
WT.				
FALL				

* POCKET PENETROMETER READING

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT, trace fine gravel		Moist
						Gray SILT, trace fine gravel		
		4-8		55	ND	Brown clayey SILT, trace gravel		
-5						Brown clayey SILT		Very moist
						Pink fine-coarse GRAVEL		
						Gray to brown-gray clayey SILT, trace fine sand		
		8-12		87.5	ND	Brown-gray clayey SILT, some fine sand		Wet @ 8.0'
-10								
						Brown-gray silty CLAY		
		12-14		100	ND	Gray plastic CLAY, silt layer @14.0'		
						End of boring @ 14.0'		
-15								
-20								
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 5.0'-6.0', 8.0'-10.0', and 12.0'-13.0' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-09

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124882.71 **EASTING:** 953436.16
GROUND ELEVATION:	392.04
DATE STARTED:	1/11/16
DATE FINISHED:	4/14/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT, trace to some fine-coarse gravel		Very moist @ 1.0'-2.0' Wet @ 2.0'
						Brown-gray clayey SILT, some fine to coarse gravel		
						Gray-brown fine to coarse sandy SILT, trace to some clay, trace to some gravel		Saturated @ 3.0'
-5		4-8		72.5	ND	Gray-brown clayey SILT		
						Gray-brown silty fine SAND		
		8-10		100	ND	Gray CLAY		
-10						End of boring @ 10.0'		
-15								
-20								
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 5.0'-6.0', 8.0'-10.0', and 12.0'-13.0' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-10

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124856.07 **EASTING:** 953407.24
GROUND ELEVATION:	397.17
DATE STARTED:	1/11/16
DATE FINISHED:	4/11/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	CAS.	SAMPLER	CORE	TUBE
			TYPE		Macrocore		
			DIA.		2"		
			WT.				
			FALL				
			* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT, some fine gravel		
						Gray to brown-gray silty CLAY, trace fine gravel		Moist
		4-8		45	ND			Moist
-5						Gray clayey SILT, trace coarse sand, trace fine gravel		
		8-12		80	ND	Gray silty fine SAND, trace peaty material		Wet @ 8.0'
-10						Gray clayey SILT, trace fine sand		
		12-16		100	ND	Gray silty fine SAND		
						Gray silty CLAY with brown laminations		
-15						Gray CLAY, moderately plastic		
						End of boring @ 16.0'		
-20								
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.
Collected sample from 6.0'-8.0', 8.0'-10.0', and 12.0'-14.0' for analysis of VOCs and PCBs

AECOM

TEST BORING LOG

BORING NO. : TR3-SB-11

PROJECT/PROJECT LOCATION:	UTC TR3 North Wall PDI
CLIENT:	UTC
BORING CONTRACTOR:	Parratt-Wolff
SHEET:	1 OF 1
JOB NO. :	60428933
NORTHING:	1124850.79 **EASTING:** 953819.38
GROUND ELEVATION:	397.47
DATE STARTED:	4/14/16
DATE FINISHED:	4/14/16
DRILLER:	Jolaan Price
GEOLOGIST:	R. Murphy
REVIEWED BY:	K. Connare

GROUNDWATER:

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

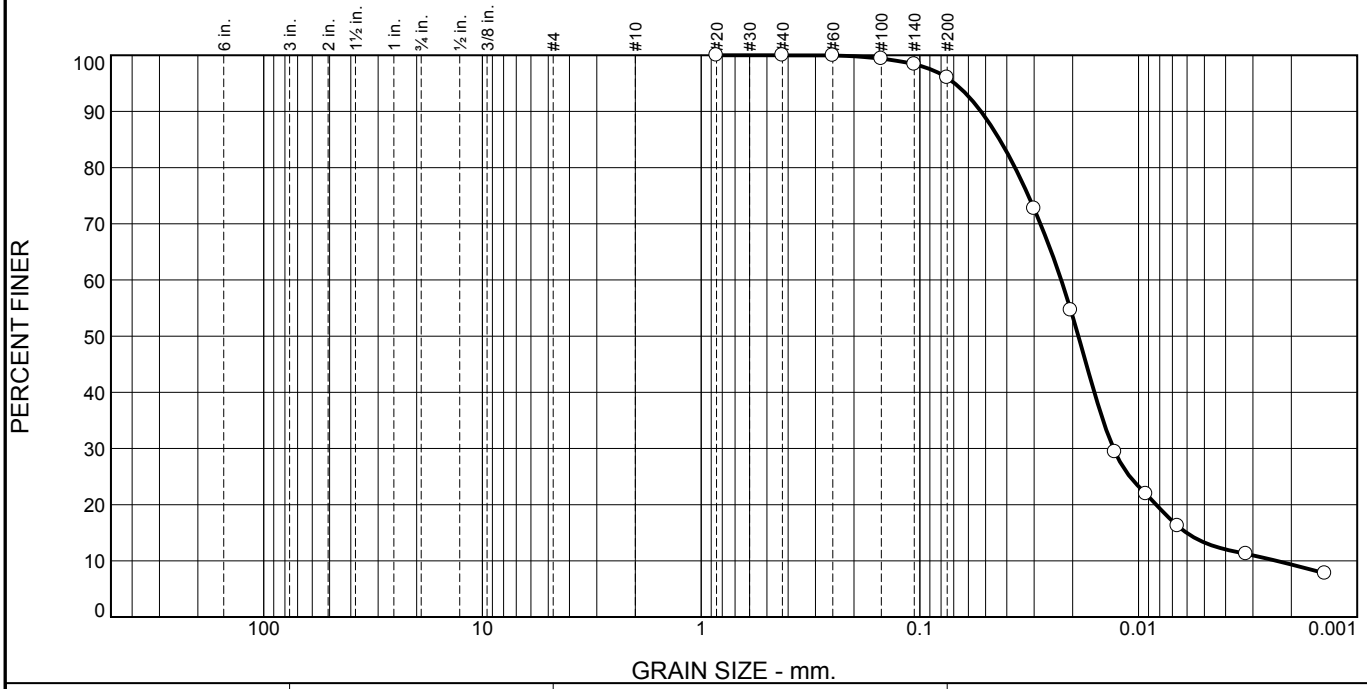
DEPTH FEET	STRATA	SAMPLE DEPTH	SAMPLE BLOW COUNTS	RECOVERY (%)	PID DIRECT/ HEAD-SPACE	MATERIAL DESCRIPTION	WELL CONSTRUCTION	REMARKS
0		0-4			ND	Brown clayey SILT with GRAVEL		
						Gray-brown clayey SILT with GRAVEL		Very moist
-5		4-8		37.5	ND	Gray clayey SILT, some fine gravel		Wet @ 4.0'
-10		8-12		12.5	ND	Gray clayey SILT with GRAVEL		
		12-16		82.5	ND	Gray silty fine SAND, trace peat & wood		
						Gray CLAY, moderately plastic		
-15					ND	Thin silty fine sand seam @ 15-15.1'		
						End of boring @ 16.0'		
-20								
-25								

COMMENTS: Boring hand cleared to 5.0' then advanced with track mounted 6712DT Geoprobe rig.

Collected sample from 4.0'-8.0', 8.0'-12.0', and 13.0'-14.0' for analysis of VOCs and PCBs

Appendix B
Geotechnical Laboratory Reports

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	4.0	82.7	13.3

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	100.0		
#60	100.0		
#100	99.4		
#140	98.4		
#200	96.0		
0.0300 mm.	72.7		
0.0204 mm.	54.6		
0.0128 mm.	29.4		
0.0092 mm.	21.9		
0.0066 mm.	16.2		
0.0032 mm.	11.2		
0.0014 mm.	7.8		

* (no specification provided)

Material Description

ID# 16-039

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.0525 D_{85}= 0.0431 D_{60}= 0.0226
D_{50}= 0.0188 D_{30}= 0.0130 D_{15}= 0.0060
D_{10}= 0.0023 C_u= 9.65 C_c= 3.21

Remarks

Date Received: 1/29/16 **Date Tested:** 2/10/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-02 32-34'

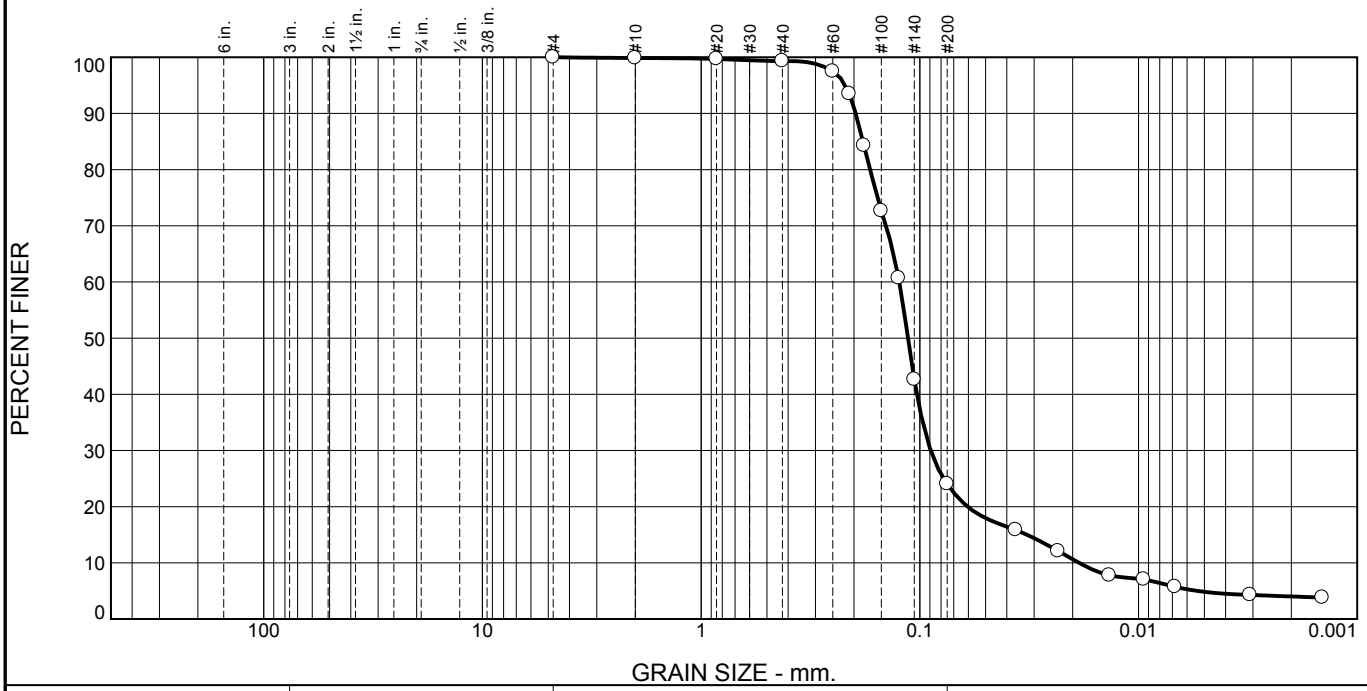
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.6	75.3	19.2	4.8

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#20	99.7		
#40	99.3		
#60	97.5		
#70	93.5		
#80	84.3		
#100	72.7		
#120	60.7		
#140	42.6		
#200	24.0		
0.0365 mm.	15.9		
0.0233 mm.	12.1		
0.0136 mm.	7.8		
0.0095 mm.	7.0		
0.0068 mm.	5.7		
0.0031 mm.	4.3		
0.0014 mm.	3.8		

* (no specification provided)

Material Description

ID# 16-040

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.1965 D_{85}= 0.1819 D_{60}= 0.1241
D_{50}= 0.1133 D_{30}= 0.0892 D_{15}= 0.0324
D_{10}= 0.0187 C_u= 6.63 C_c= 3.43

Remarks

Date Received: 1/29/16 **Date Tested:** 2/17/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-02 34-36'

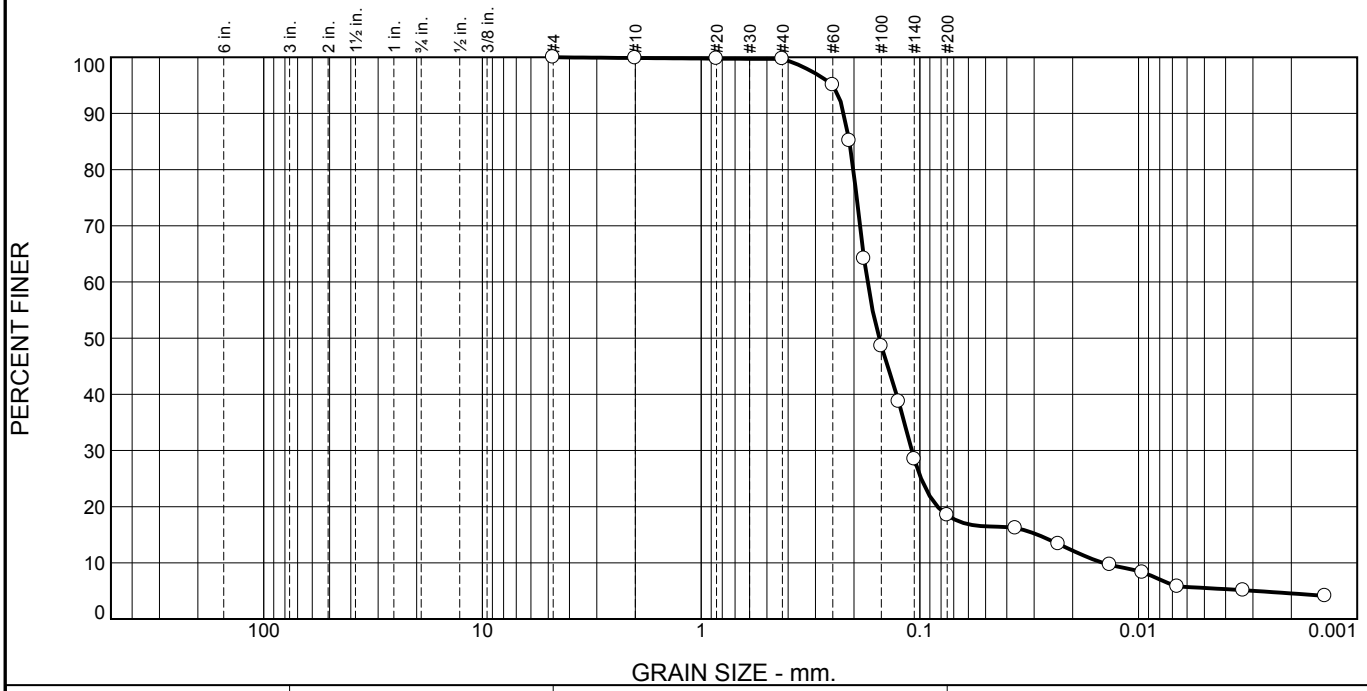
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.2	81.2	13.0	5.5

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.7		
#60	95.1		
#70	85.2		
#80	64.2		
#100	48.6		
#120	38.7		
#140	28.5		
#200	18.5		
0.0365 mm.	16.2		
0.0233 mm.	13.4		
0.0135 mm.	9.7		
0.0096 mm.	8.3		
0.0067 mm.	5.8		
0.0033 mm.	5.1		
0.0014 mm.	4.1		

* (no specification provided)

Material Description

ID# 16-041

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.2219 D_{85}= 0.2097 D_{60}= 0.1737
D_{50}= 0.1535 D_{30}= 0.1089 D_{15}= 0.0289
D_{10}= 0.0145 C_u= 11.95 C_c= 4.70

Remarks

Date Received: 1/29/16 **Date Tested:** 2/11/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-02; 36-38'

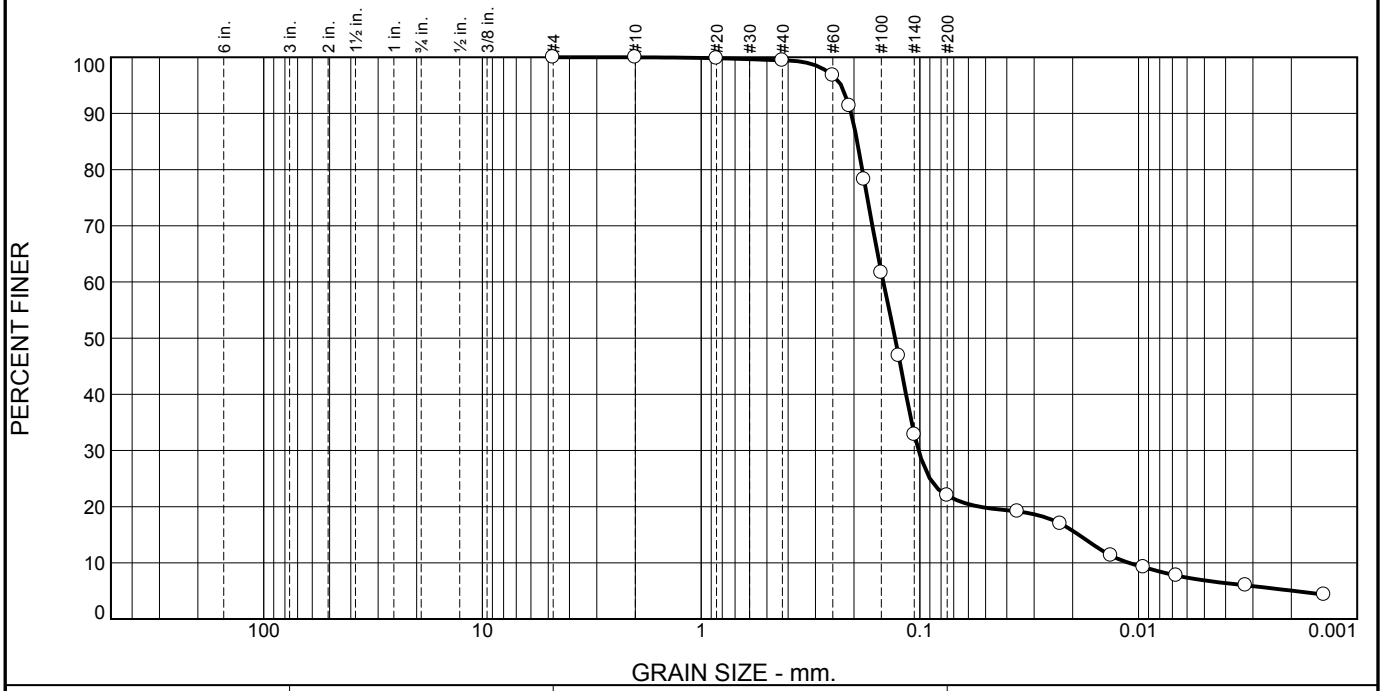
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	77.4	15.1	6.9

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	100.0		
#20	99.8		
#40	99.4		
#60	96.8		
#70	91.4		
#80	78.3		
#100	61.7		
#120	46.9		
#140	32.8		
#200	22.0		
0.0358 mm.	19.1		
0.0228 mm.	17.0		
0.0134 mm.	11.3		
0.0095 mm.	9.2		
0.0067 mm.	7.7		
0.0032 mm.	6.0		
0.0014 mm.	4.3		

* (no specification provided)

Material Description

ID# 16-042

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.2057 D_{85}= 0.1934 D_{60}= 0.1470
D_{50}= 0.1297 D_{30}= 0.1014 D_{15}= 0.0188
D_{10}= 0.0111 C_u= 13.29 C_c= 6.32

Remarks

Date Received: 1/29/16 **Date Tested:** 2/17/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-02 38-39.5'

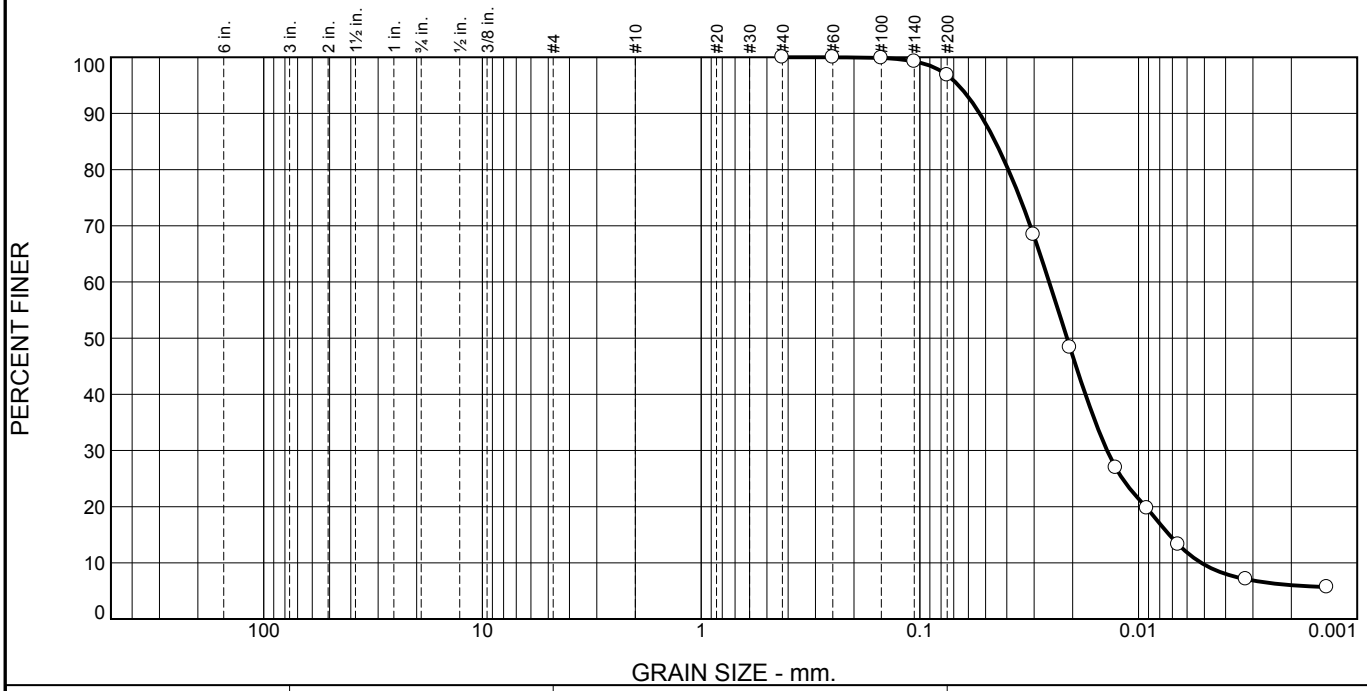
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	3.2	87.1	9.7

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#40	100.0		
#60	100.0		
#100	99.9		
#140	99.2		
#200	96.8		
0.0302 mm.	68.4		
0.0206 mm.	48.4		
0.0127 mm.	26.9		
0.0092 mm.	19.7		
0.0066 mm.	13.3		
0.0032 mm.	7.1		
0.0014 mm.	5.7		

* (no specification provided)

Material Description

ID# 16-043

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.0533 D_{85}= 0.0452 D_{60}= 0.0256
D_{50}= 0.0212 D_{30}= 0.0139 D_{15}= 0.0072
D_{10}= 0.0052 C_u= 4.96 C_c= 1.47

Remarks

Date Received: 1/29/16 **Date Tested:** 2/11/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-03 30-32'

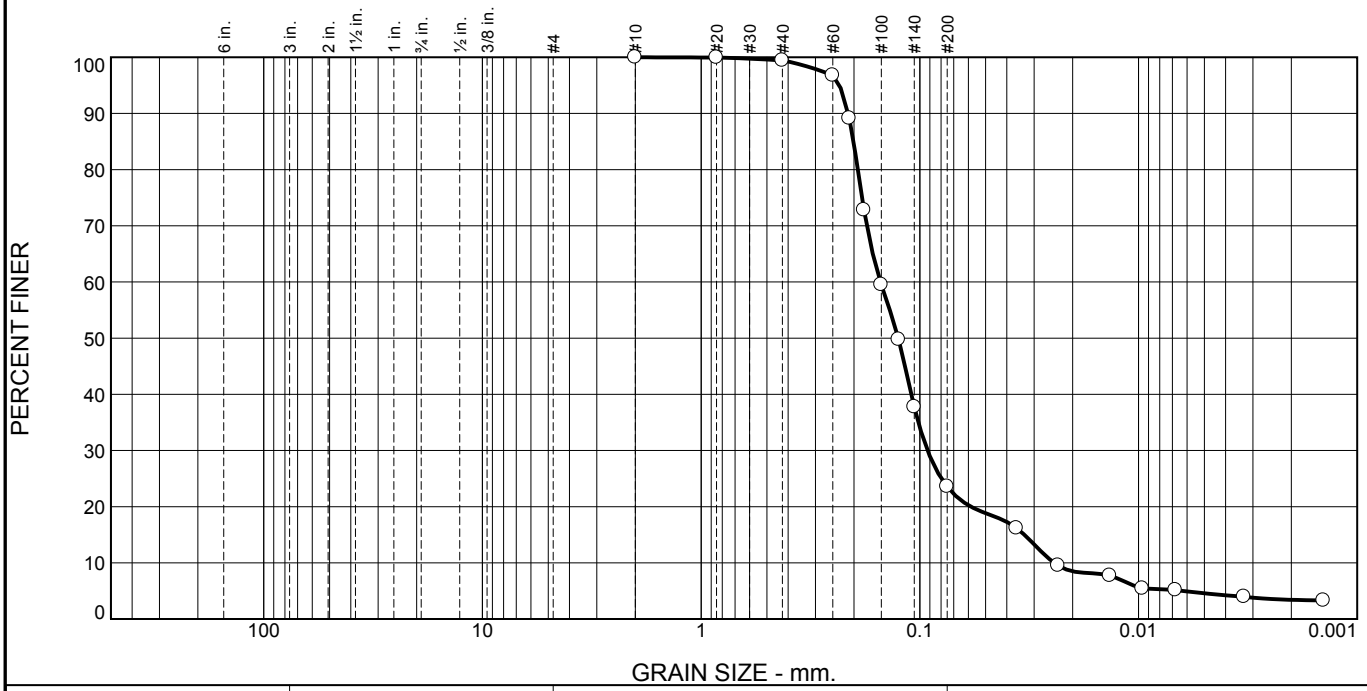
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	75.8	19.0	4.6

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	100.0		
#40	99.4		
#60	96.8		
#70	89.1		
#80	72.8		
#100	59.5		
#120	49.8		
#140	37.7		
#200	23.6		
0.0361 mm.	16.2		
0.0233 mm.	9.5		
0.0135 mm.	7.7		
0.0096 mm.	5.4		
0.0068 mm.	5.2		
0.0033 mm.	4.0		
0.0014 mm.	3.3		

* (no specification provided)

Material Description

ID# 16-044

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.2123 D_{85}= 0.2011 D_{60}= 0.1514
D_{50}= 0.1255 D_{30}= 0.0922 D_{15}= 0.0333
D_{10}= 0.0243 C_u= 6.23 C_c= 2.31

Remarks

Date Received: 1/29/16 **Date Tested:** 2/11/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-03; 32.5-34'

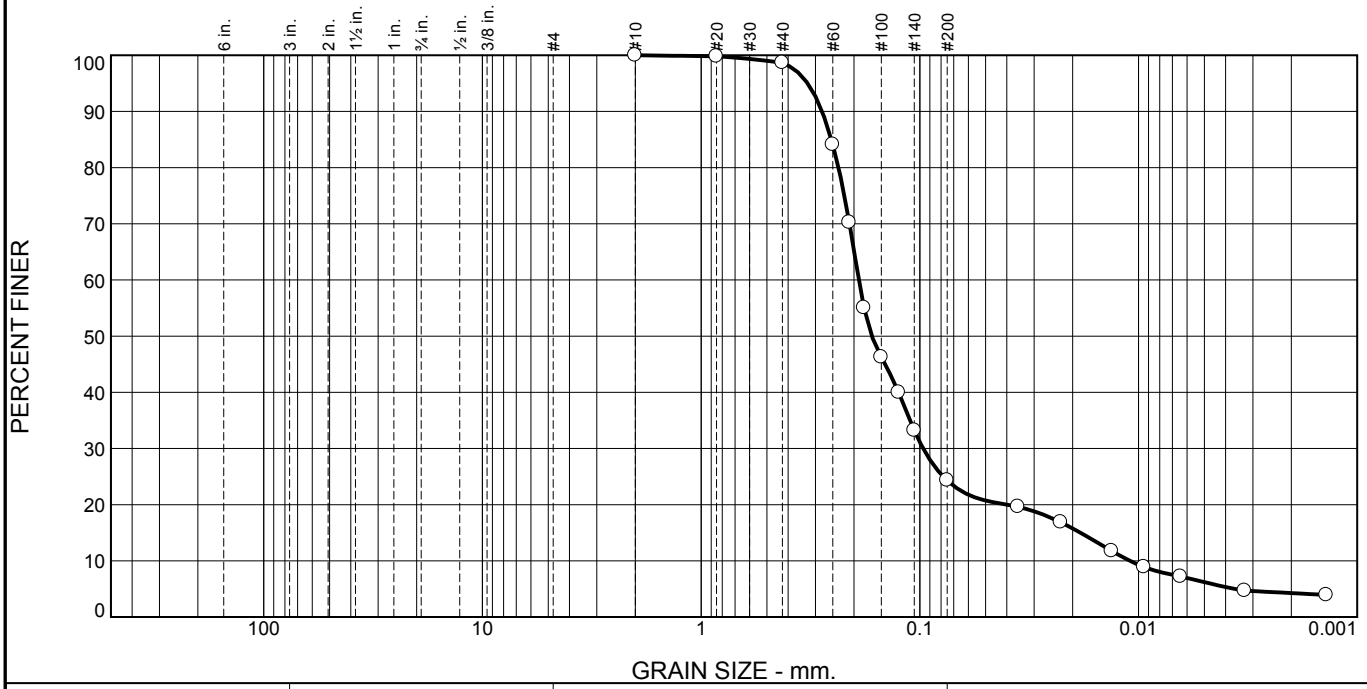
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	74.4	18.1	6.2

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.8		
#40	98.7		
#60	84.1		
#70	70.2		
#80	55.0		
#100	46.3		
#120	40.0		
#140	33.2		
#200	24.3		
0.0356 mm.	19.6		
0.0227 mm.	16.9		
0.0133 mm.	11.8		
0.0094 mm.	8.9		
0.0064 mm.	7.2		
0.0033 mm.	4.7		
0.0014 mm.	3.9		

* (no specification provided)

Material Description

ID# 16-045

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.2799 D_{85}= 0.2537 D_{60}= 0.1902
D_{50}= 0.1658 D_{30}= 0.0966 D_{15}= 0.0184
D_{10}= 0.0109 C_u= 17.39 C_c= 4.48

Remarks

Date Received: 1/29/16 **Date Tested:** 2/11/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-03 34-36'

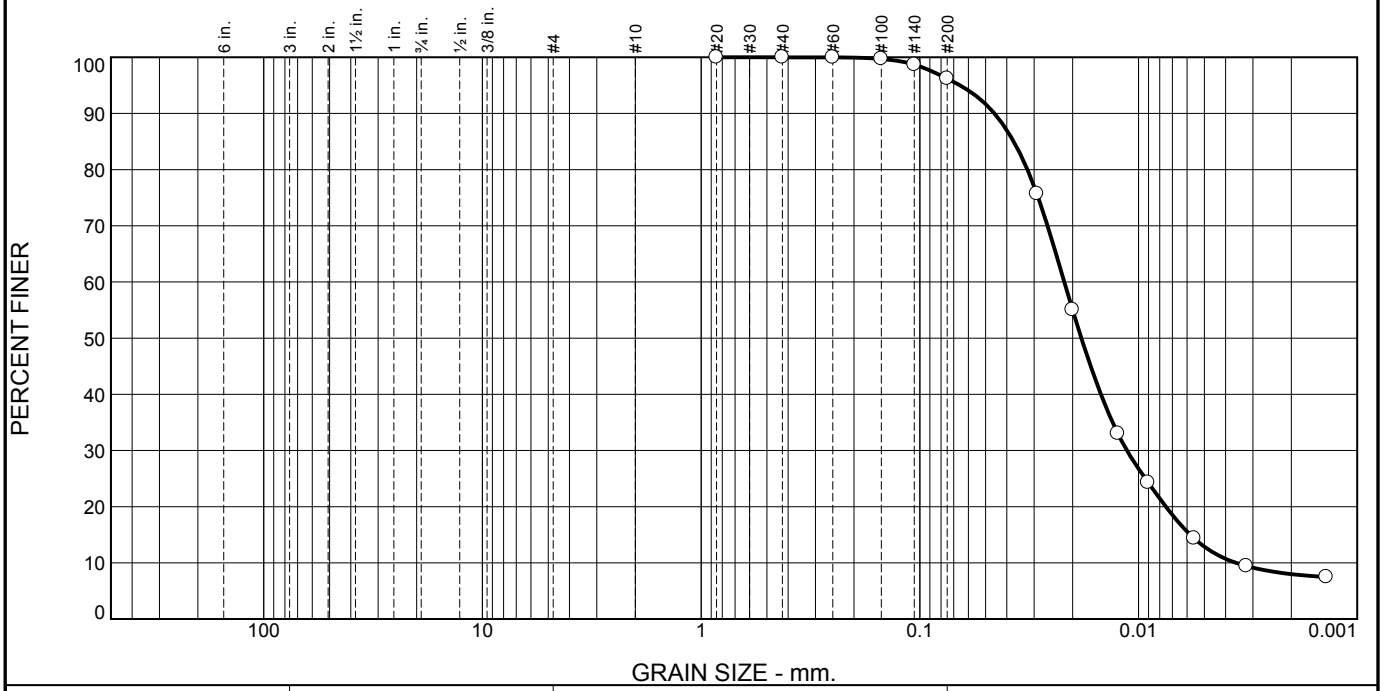
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	3.8	83.3	12.9

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#20	100.0		
#40	100.0		
#60	100.0		
#100	99.7		
#140	98.7		
#200	96.2		
0.0291 mm.	75.7		
0.0200 mm.	55.0		
0.0124 mm.	33.0		
0.0090 mm.	24.3		
0.0056 mm.	14.3		
0.0032 mm.	9.4		
0.0014 mm.	7.5		

* (no specification provided)

Material Description

ID# 16-046

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.0456 D_{85}= 0.0372 D_{60}= 0.0218
D_{50}= 0.0183 D_{30}= 0.0113 D_{15}= 0.0058
D_{10}= 0.0036 C_u= 6.09 C_c= 1.63

Remarks

Date Received: 1/29/16 **Date Tested:** 2/10/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-04 37-38.5'

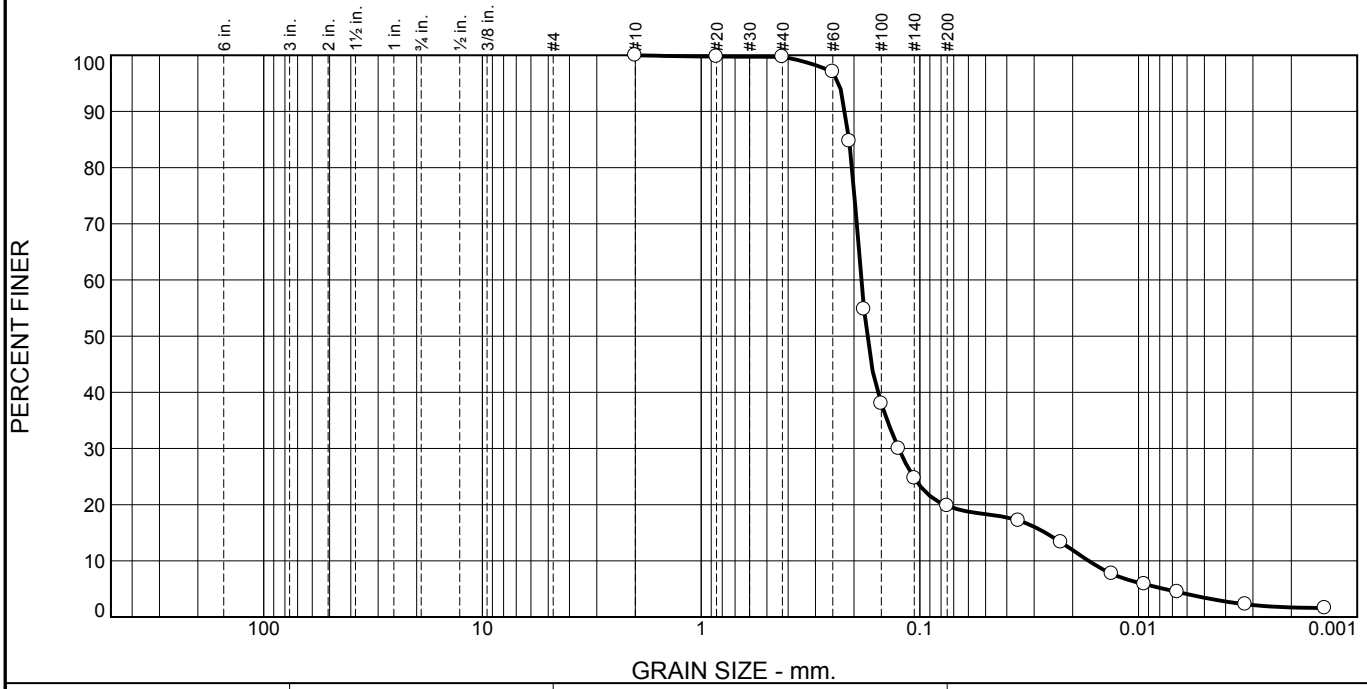
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	79.9	16.4	3.4

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.8		
#40	99.7		
#60	97.1		
#70	84.7		
#80	54.8		
#100	38.0		
#120	30.0		
#140	24.7		
#200	19.8		
0.0354 mm.	17.2		
0.0226 mm.	13.3		
0.0133 mm.	7.7		
0.0094 mm.	5.9		
0.0066 mm.	4.5		
0.0032 mm.	2.3		
0.0014 mm.	1.6		

* (no specification provided)

Material Description

ID# 16-047

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.2189 D_{85}= 0.2104 D_{60}= 0.1852
D_{50}= 0.1743 D_{30}= 0.1250 D_{15}= 0.0267
D_{10}= 0.0169 C_u= 10.97 C_c= 5.00

Remarks

Date Received: 1/29/16 **Date Tested:** 2/17/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-04 38.5-39'

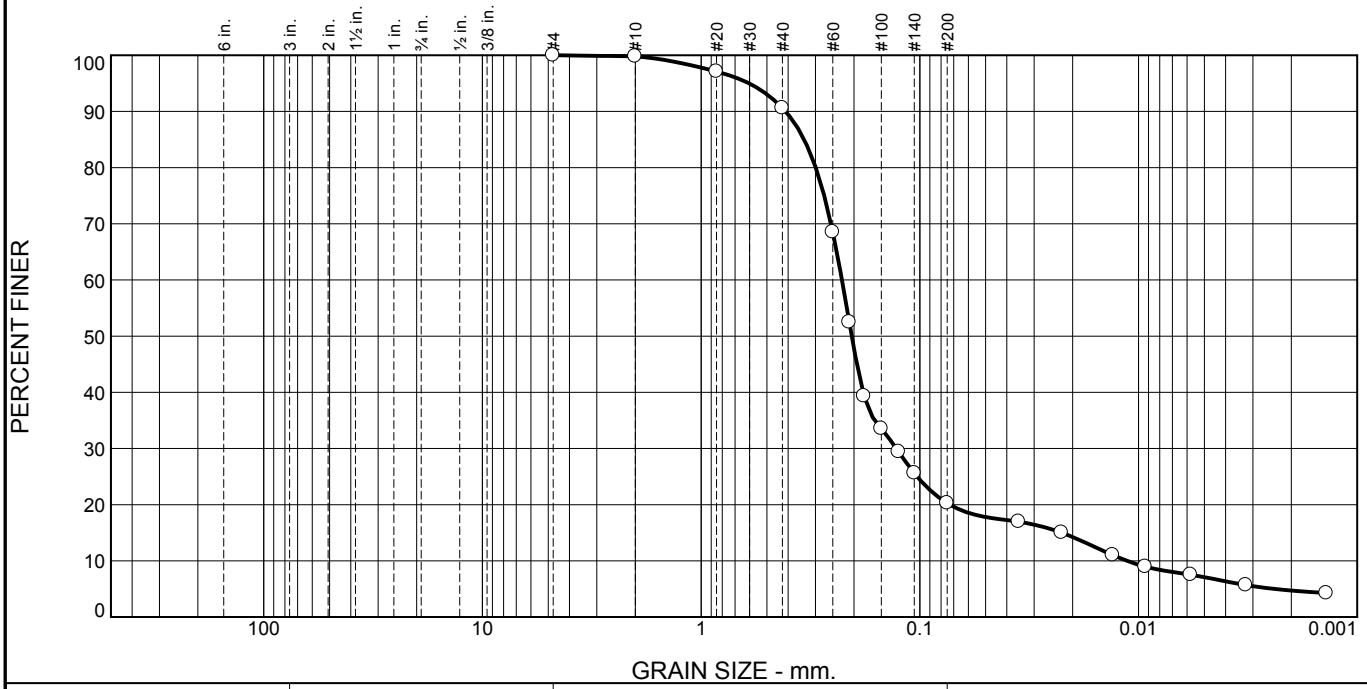
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	9.2	70.3	13.2	7.1

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.8		
#20	97.1		
#40	90.6		
#60	68.5		
#70	52.5		
#80	39.3		
#100	33.6		
#120	29.4		
#140	25.6		
#200	20.3		
0.0354 mm.	17.0		
0.0225 mm.	15.0		
0.0131 mm.	11.0		
0.0093 mm.	9.0		
0.0058 mm.	7.5		
0.0032 mm.	5.7		
0.0014 mm.	4.3		

* (no specification provided)

Material Description

ID# 16-048

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.4115 D_{85}= 0.3379 D_{60}= 0.2270
D_{50}= 0.2047 D_{30}= 0.1281 D_{15}= 0.0224
D_{10}= 0.0113 C_u= 20.13 C_c= 6.42

Remarks

Date Received: 1/29/16 **Date Tested:** 2/10/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-04; 39-40.5'

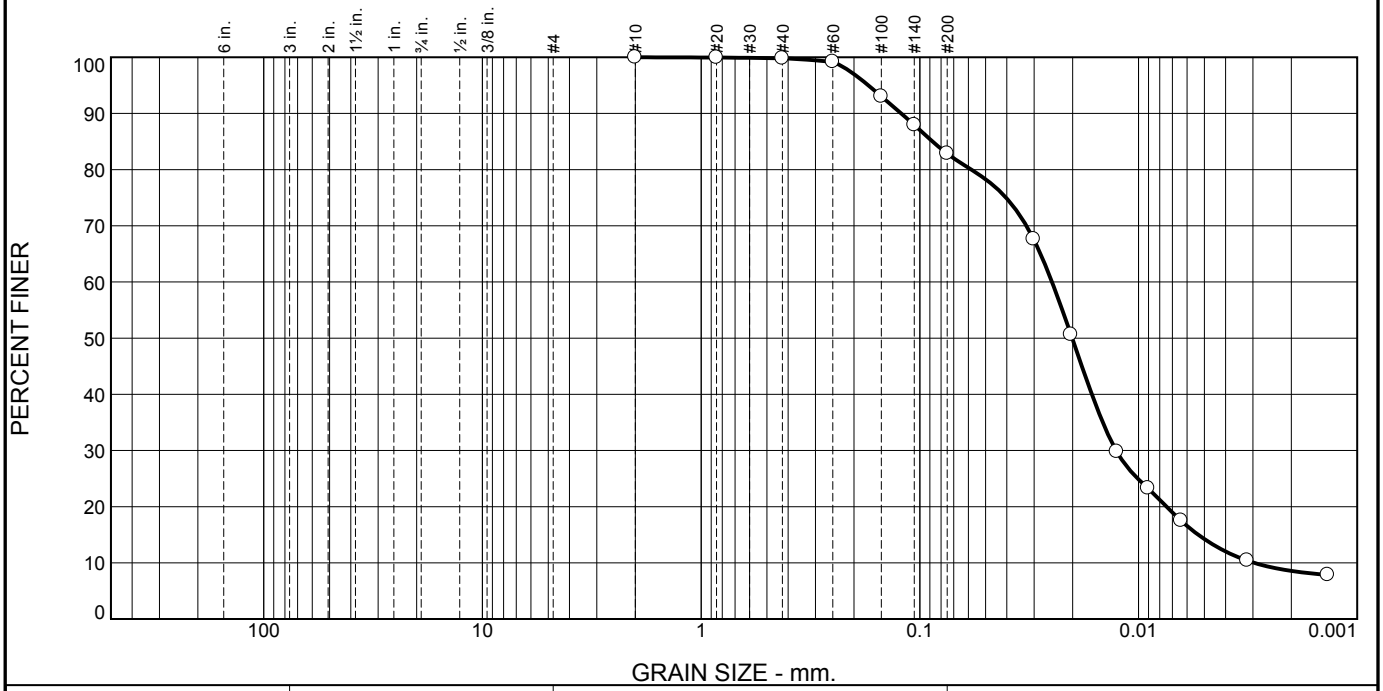
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	16.9	68.7	14.2

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.2		
#100	93.0		
#140	87.9		
#200	82.9		
0.0302 mm.	67.6		
0.0204 mm.	50.6		
0.0126 mm.	29.8		
0.0091 mm.	23.3		
0.0064 mm.	17.5		
0.0032 mm.	10.4		
0.0014 mm.	7.8		

* (no specification provided)

Material Description

ID# 16-049

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.1217 D_{85}= 0.0874 D_{60}= 0.0249
D_{50}= 0.0201 D_{30}= 0.0127 D_{15}= 0.0053
D_{10}= 0.0030 C_u= 8.41 C_c= 2.18

Remarks

Date Received: 1/29/16 **Date Tested:** 2/11/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-05; 38-39'

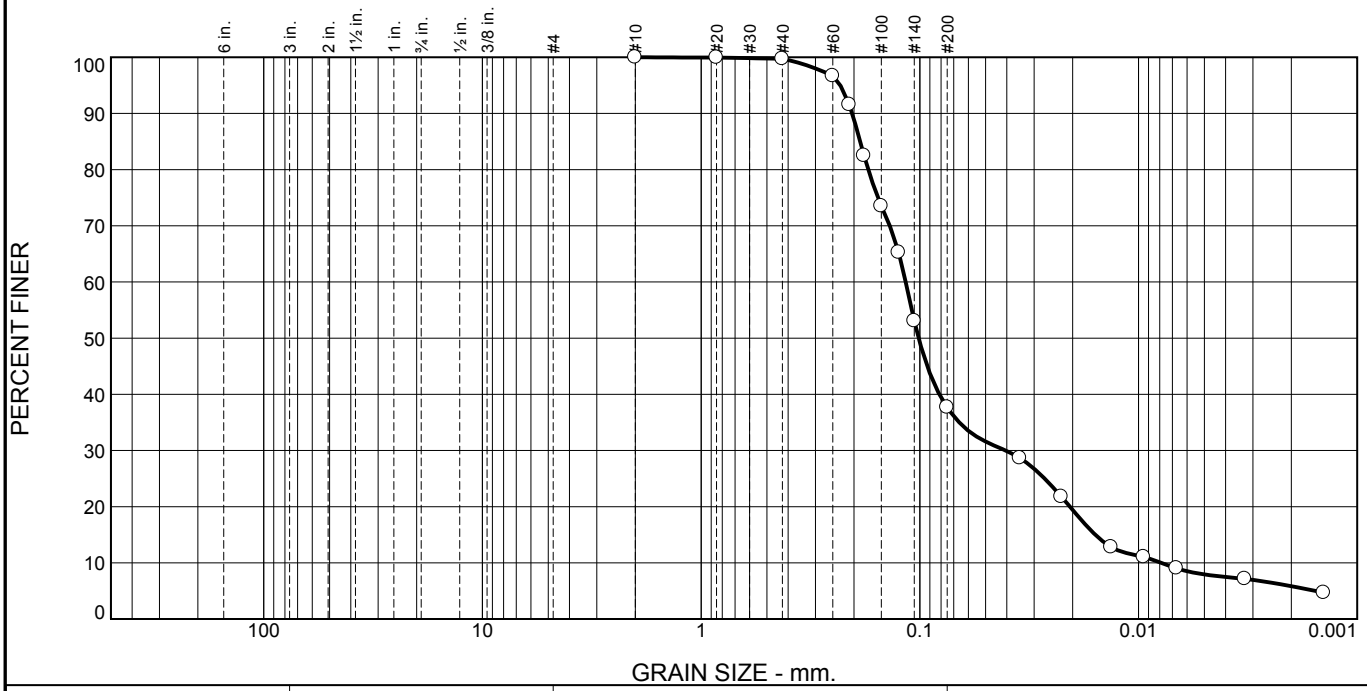
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	62.0	29.8	7.9

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.9		
#40	99.7		
#60	96.7		
#70	91.5		
#80	82.5		
#100	73.5		
#120	65.3		
#140	53.1		
#200	37.7		
0.0349 mm.	28.6		
0.0225 mm.	21.8		
0.0133 mm.	12.8		
0.0095 mm.	11.0		
0.0067 mm.	9.0		
0.0033 mm.	7.1		
0.0014 mm.	4.7		

* (no specification provided)

Material Description

ID# 16-050

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.2038 D_{85}= 0.1875 D_{60}= 0.1161
D_{50}= 0.1013 D_{30}= 0.0406 D_{15}= 0.0158
D_{10}= 0.0079 C_u= 14.74 C_c= 1.80

Remarks

Date Received: 1/29/16 **Date Tested:** 2/11/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-05; 39-40'

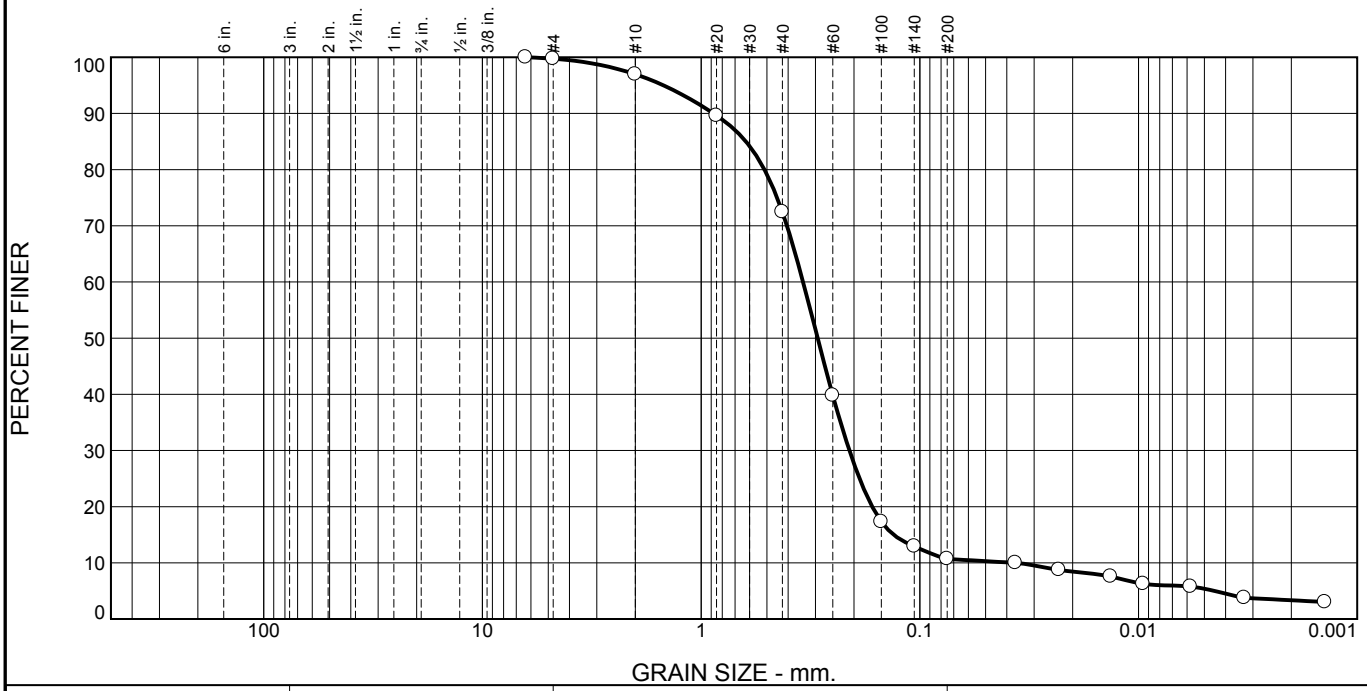
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	2.7	24.6	61.7	5.3	5.4

TEST RESULTS (D422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1/4"	100.0		
#4	99.7		
#10	97.0		
#20	89.6		
#40	72.4		
#60	39.8		
#100	17.3		
#140	12.9		
#200	10.7		
0.0365 mm.	10.0		
0.0231 mm.	8.7		
0.0134 mm.	7.6		
0.0095 mm.	6.3		
0.0058 mm.	5.8		
0.0033 mm.	3.8		
0.0014 mm.	3.0		

* (no specification provided)

Material Description

ID# 16-051

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 0.8797 D_{85}= 0.6233 D_{60}= 0.3418
D_{50}= 0.2932 D_{30}= 0.2099 D_{15}= 0.1319
D_{10}= 0.0366 C_u= 9.35 C_c= 3.52

Remarks

Date Received: 1/29/16 **Date Tested:** 2/9/16

Tested By: ETC

Checked By: JMA

Title: LM

Source of Sample: UTC-TR3 North Wall PDI **Date Sampled:**
Sample Number: GB-05; 40-42'

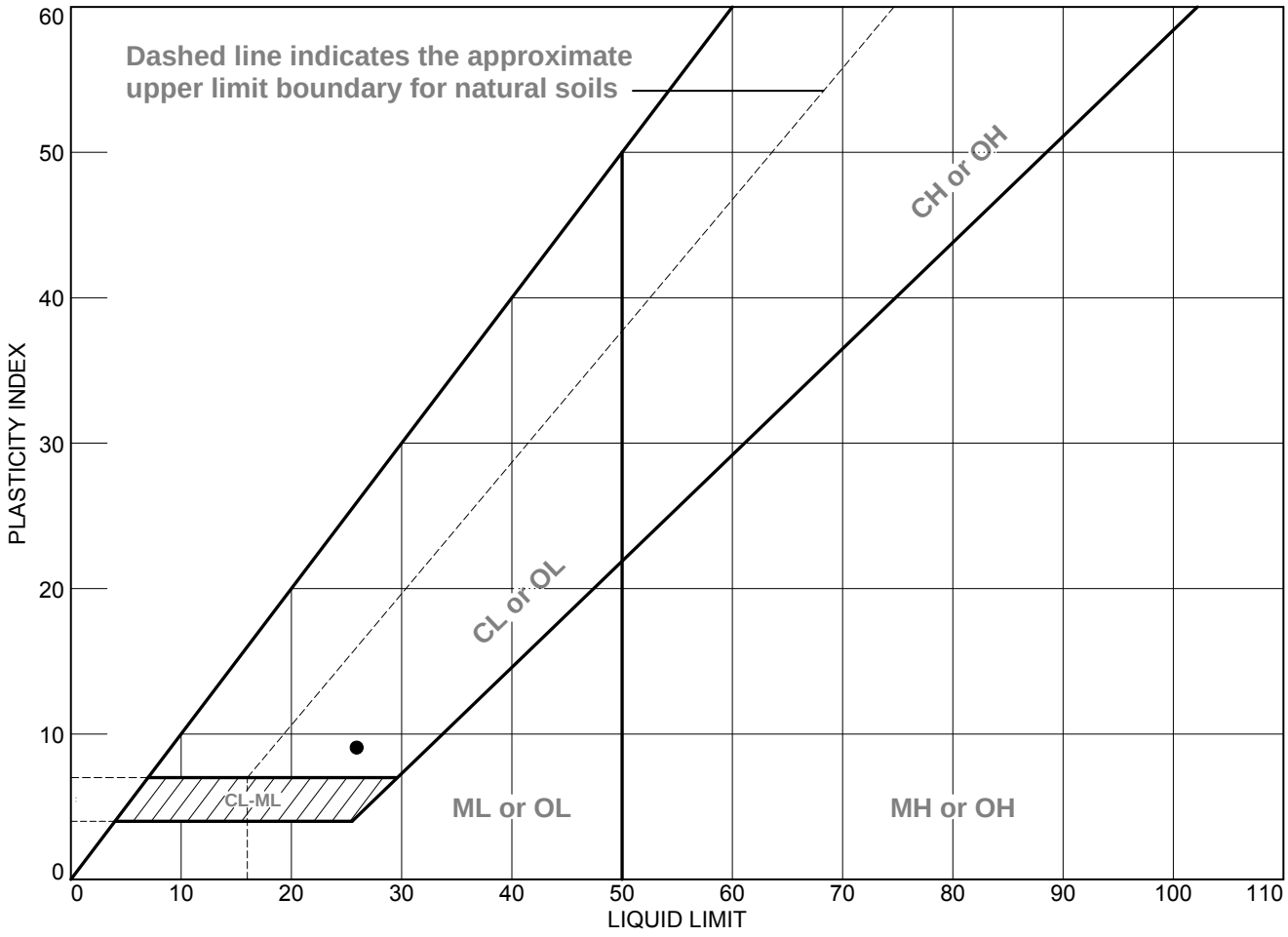
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI

Project No: 16-004 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	UTC-TR3 North Wall PDI	GB-02; 22-24'		26.7	17	26	9	

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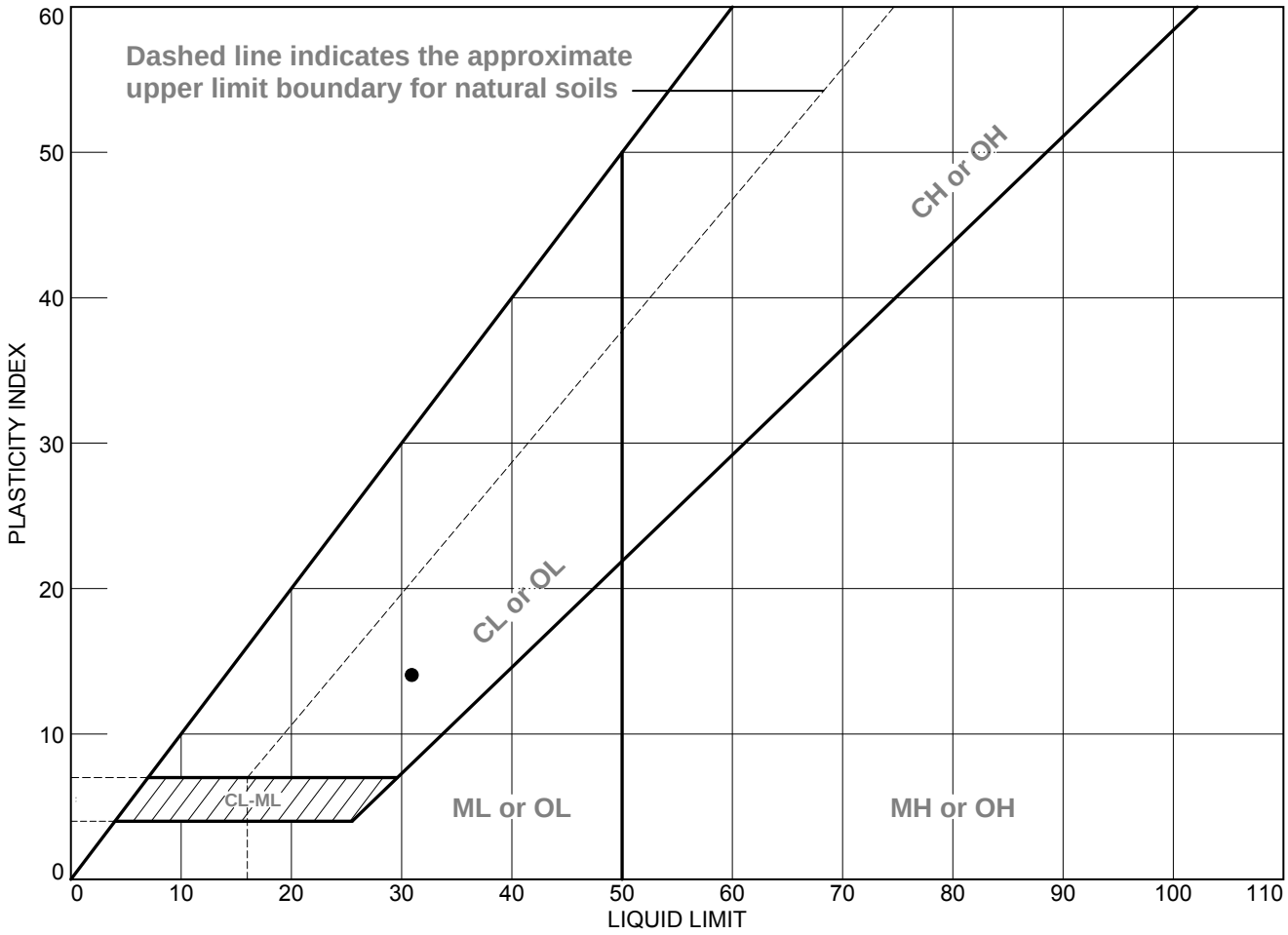
East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI
Project No.: 16-004 **Figure**

Tested By: ETC 2/18/16 **Checked By:** JMA

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	UTC-TR3 North Wall PDI	GB-03; 22-24'		36.8	17	31	14	

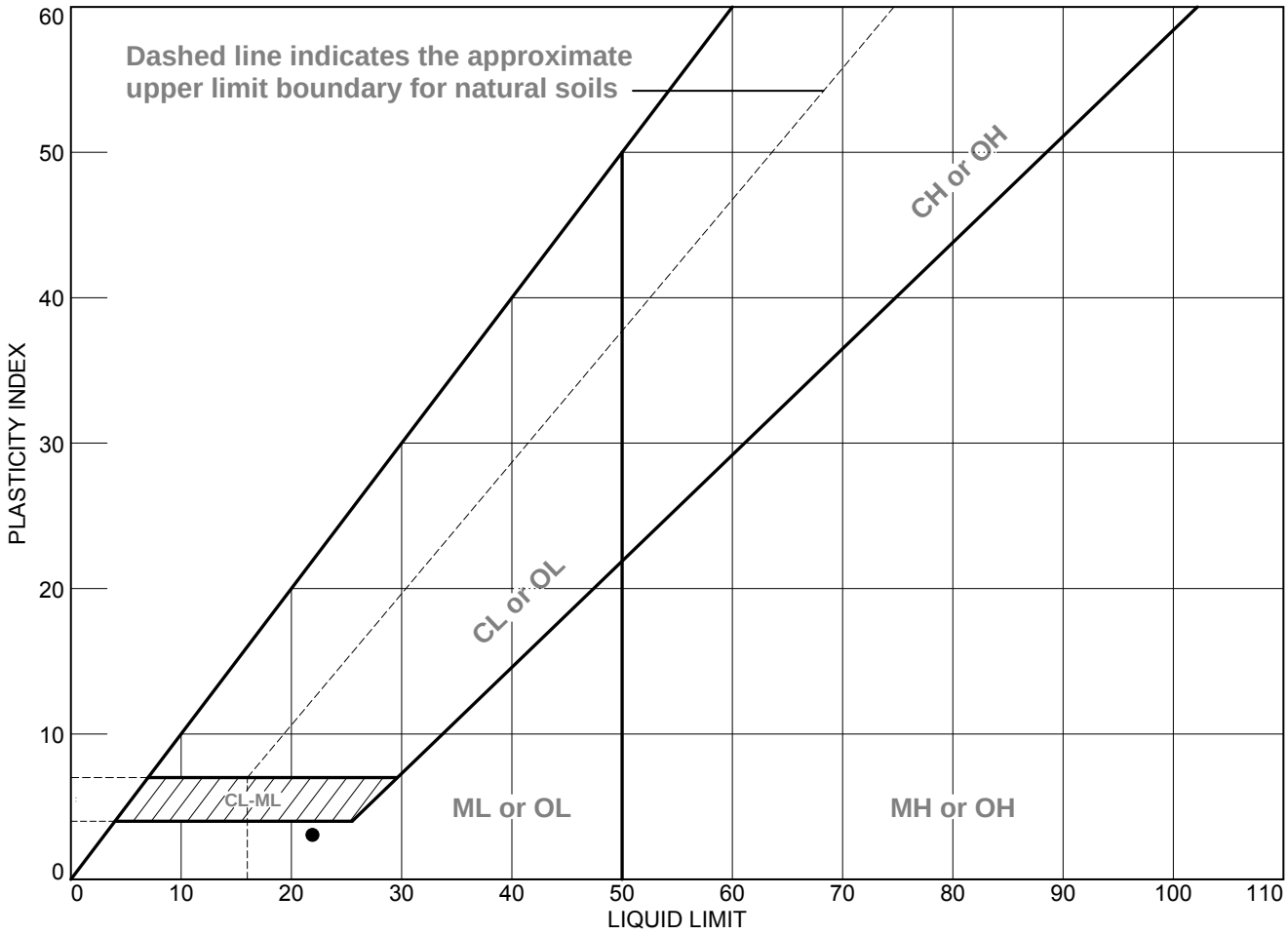
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI
Project No.: 16-004 **Figure**

Tested By: ETC 2/18/16 **Checked By:** JMA

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	UTC-TR3 North Wall PDI	GB-03; 24-26'		21.3	19	22	3	

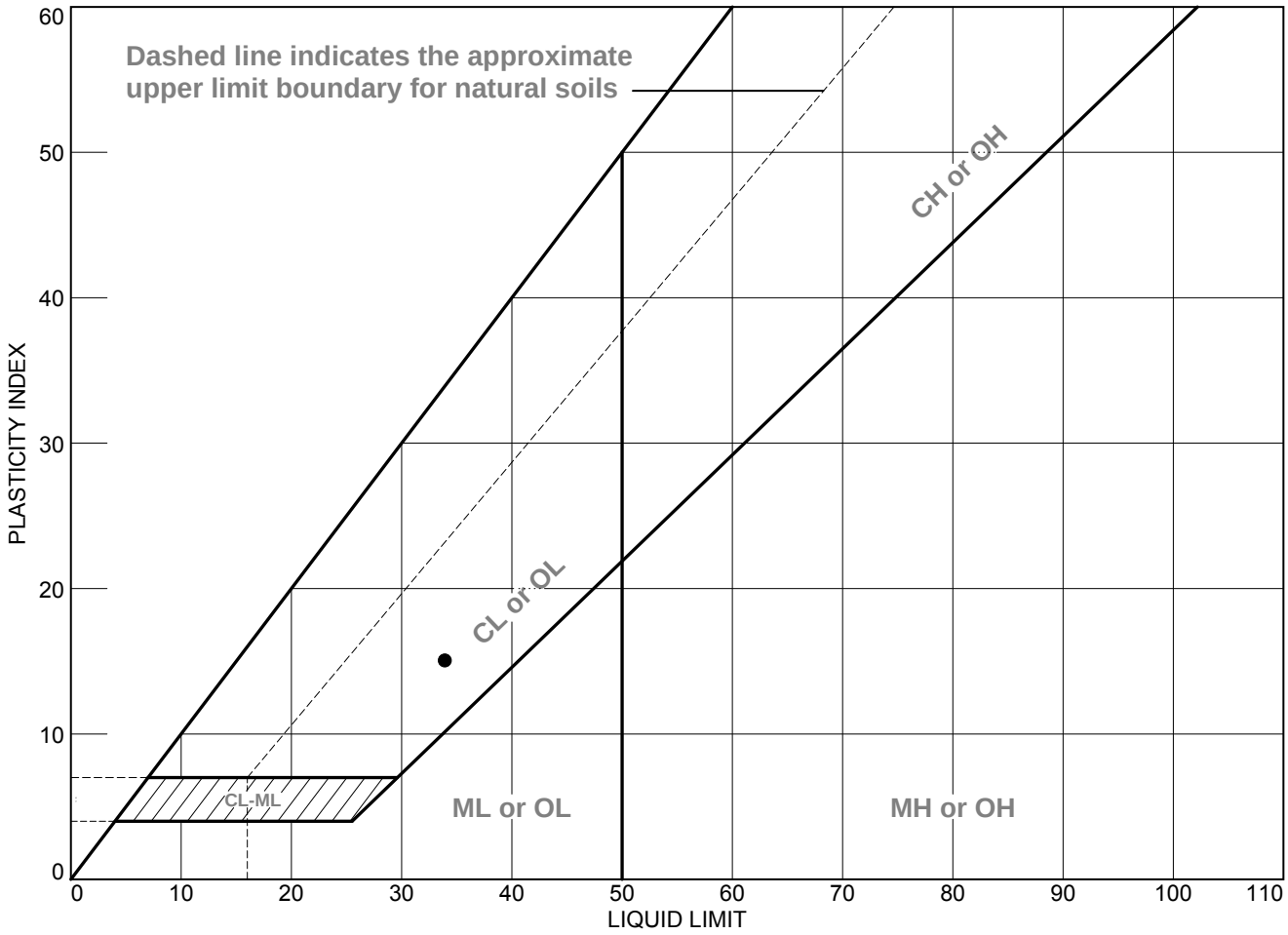
3rd Rock, LLC

East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI
Project No.: 16-004 **Figure**

Tested By: ETC 2/18/16 **Checked By:** JMA

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	UTC-TR3 North Wall PDI	GB-04; 23-25'		32.6	19	34	15	

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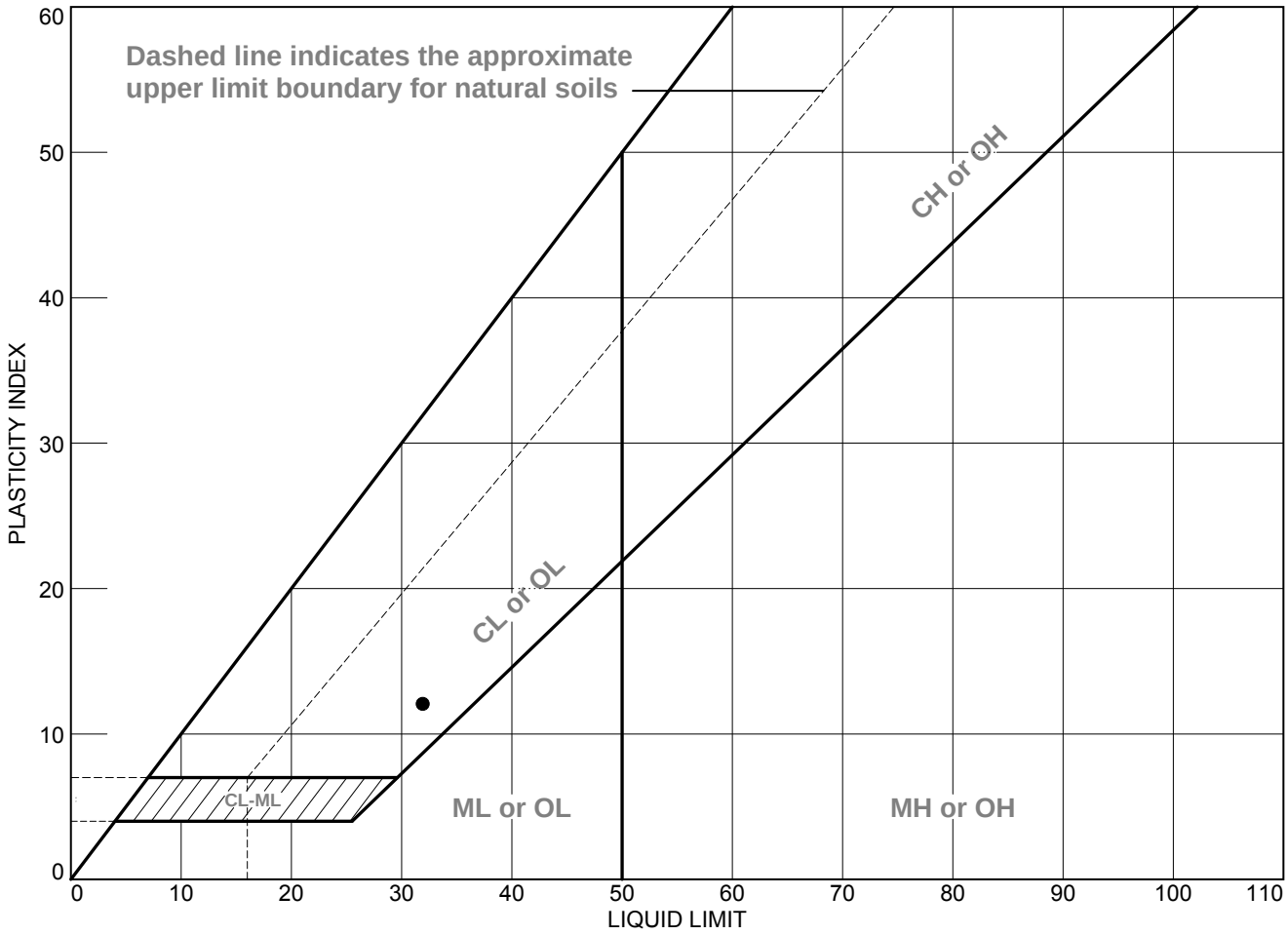
East Aurora, NY

Client: AECOM
Project: UTC-TR3 North Wall PDI
Project No.: 16-004 **Figure**

Tested By: ETC 2/16/16 **Checked By:** JMA

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	UTC-TR3 North Wall PDI	GB-05; 20-22'		32.0	20	32	12	

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Client: AECOM
Project: UTC-TR3 North Wall PDI
Project No.: 16-004 **Figure**

Tested By: ETC 2/12/16 **Checked By:** JMA

Final Report Unconsolidated-Undrained Triaxial Compression on Cohesive Soils
ASTM D2850

Project:	UTC TR3 North Wall PDI	**Analyst:**	ETC/JMA
Project No.:	16-004	**Date:**	2/12/2016
Client:	AECOM		
Sample No.	GB-02, 22-24'	**Confining Stress, psi:**	10.0
Lab ID No.:	16-034	**Sample Preparation:**	Intact Sample

Initial Sample Data

Avg. Height, in:	5.804	**Specific Gravity:**	2.7
Avg. Diameter, in:	2.874	**Assumed or D854:**	Assumed
Area, in^2:	6.485	**Void Ratio:**	0.716
L/D Ratio:	2.020	**Degree of Saturation, %:**	100.6%
Water Content, %:	26.7		
Wet Density, pcf:	124.4		
Dry Density, pcf:	98.2		

Shear Conditions:

Confining Stress (Cell Pressure), psi	10.0
Rate of Axial Strain, %/min:	1.000

Failure Critereon:

Failure Critereon:	15% Axial Strain
Maximum Deviator Stress, psi:	13.0
Axial Strain. %:	15
Minor Principal Stress, psi:	10.00
Major Principal Stress, psi:	22.99
Compressive Strength, psi:	13.0

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Final Report Unconsolidated-Undrained Triaxial Compression on Cohesive Soils
ASTM D2850

Project:	UTC TR3 North Wall PDI	**Analyst:**	ETC/JMA
Project No.:	16-004	**Date:**	2/12/2016
Client:	AECOM		
Sample No.	GB-03, 22-24'	**Confining Stress, psi:**	10.0
Lab ID No.:	16-036	**Sample Preparation:**	Intact Sample

Initial Sample Data

Avg. Height, in:	5.943	**Specific Gravity:**	2.7
Avg. Diameter, in:	2.848	**Assumed or D854:**	Assumed
Area, in^2:	6.371	**Void Ratio:**	0.955
L/D Ratio:	2.087	**Degree of Saturation, %:**	103.9%
Water Content, %:	36.8		
Wet Density, pcf:	117.8		
Dry Density, pcf:	86.2		

Shear Conditions:

Confining Stress (Cell Pressure), psi	10.0
Rate of Axial Strain, %/min:	1.000

Failure Critereon:

Failure Critereon:	15% Axial Strain
Maximum Deviator Stress, psi:	10.7
Axial Strain. %:	15
Minor Principal Stress, psi:	10.00
Major Principal Stress, psi:	20.67
Compressive Strength, psi:	10.7

Final Report Unconsolidated-Undrained Triaxial Compression on Cohesive Soils
ASTM D2850

Project:	UTC TR3 North Wall PDI	**Analyst:**	ETC/JMA
Project No.:	16-004	**Date:**	2/12/2016
Client:	AECOM		
Sample No.	GB-03, 24-26'	**Confining Stress, psi:**	10.0
Lab ID No.:	16-035	**Sample Preparation:**	Intact Sample

Initial Sample Data

Avg. Height, in:	5.691	**Specific Gravity:**	2.7
Avg. Diameter, in:	2.880	**Assumed or D854:**	Assumed
Area, in^2:	6.516	**Void Ratio:**	0.528
L/D Ratio:	1.976	**Degree of Saturation, %:**	109.1%
Water Content, %:	21.3		
Wet Density, pcf:	133.8		
Dry Density, pcf:	110.2		

Shear Conditions:

Confining Stress (Cell Pressure), psi	10.0
Rate of Axial Strain, %/min:	1.000

Failure Critereon:

Failure Critereon:	15% Axial Strain
Maximum Deviator Stress, psi:	20.4
Axial Strain. %:	15
Minor Principal Stress, psi:	10.00
Major Principal Stress, psi:	30.42
Compressive Strength, psi:	20.4

Final Report Unconsolidated-Undrained Triaxial Compression on Cohesive Soils
ASTM D2850

Project:	UTC TR3 North Wall PDI	**Analyst:**	ETC/JMA
Project No.:	16-004	**Date:**	2/11/2016
Client:	AECOM		
Sample No.	GB-04, 23-25'	**Confining Stress, psi:**	10.0
Lab ID No.:	16-037	**Sample Preparation:**	Intact Sample

Initial Sample Data

Avg. Height, in:	6.232	**Specific Gravity:**	2.7
Avg. Diameter, in:	2.858	**Assumed or D854:**	Assumed
Area, in^2:	6.415	**Void Ratio:**	0.848
L/D Ratio:	2.181	**Degree of Saturation, %:**	103.8%
Water Content, %:	32.6		
Wet Density, pcf:	120.9		
Dry Density, pcf:	91.2		

Shear Conditions:

Confining Stress (Cell Pressure), psi	10.0
Rate of Axial Strain, %/min:	1.000

Failure Critereon:

Failure Critereon:	15% Strain
Maximum Deviator Stress, psi:	11.6
Axial Strain. %:	15
Minor Principal Stress, psi:	10.00
Major Principal Stress, psi:	21.63
Compressive Strength, psi:	11.6

3rd Rock, LLC
East Aurora, NY
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Final Report Unconsolidated-Undrained Triaxial Compression on Cohesive Soils
ASTM D2850

Project:	UTC TR3 North Wall PDI	**Analyst:**	ETC/JMA
Project No.:	16-004	**Date:**	2/11/2016
Client:	AECOM		
Sample No.	GB-05, 20-22'	**Confining Stress, psi:**	10.0
Lab ID No.:	16-038	**Sample Preparation:**	Intact Sample

Initial Sample Data

Avg. Height, in:	5.933	**Specific Gravity:**	2.7
Avg. Diameter, in:	2.937	**Assumed or D854:**	Assumed
Area, in^2:	6.773	**Void Ratio:**	0.873
L/D Ratio:	2.020	**Degree of Saturation, %:**	99.0%
Water Content, %:	32.0		
Wet Density, pcf:	118.7		
Dry Density, pcf:	89.9		

Shear Conditions:

Confining Stress (Cell Pressure), psi	10.0
Rate of Axial Strain, %/min:	1.000

Failure Critereon:

Failure Critereon:	Failure occurred prior to 15% axial strain.
Maximum Deviator Stress, psi:	7.0
Axial Strain. %:	11.562
Minor Principal Stress, psi:	10.00
Major Principal Stress, psi:	17.00
Compressive Strength, psi:	7.0

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East Aurora, NY
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Appendix C
Well Development Logs

WELL DEVELOPMENT LOG

PROJECT TITLE: UTC- TR3 WELL NO.: TR3-MW-01

PROJECT NO.:

STAFF: K. Stahl / E. Russo

DATE(S): 6/13/16

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	7.38	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	1.63	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	5.75	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.97	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	13	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1	5	9	13							
pH	7.79	7.81	7.90	7.60							
SPEC. COND. (umhos)	3.17	3.27	3.27	3.16							
APPEARANCE	Brn	Brn	Brn	Lt. Brn							
TEMPERATURE (°C)	8.69	8.16	8.04	10.47							
Turbidity	>999	>999	>999	>999							

COMMENTS:

- Dry @ 9 gal removed
- Allow To Recover
- Dry @ 3 gal removed
- Dry @ 1 gal removed

WELL DEVELOPMENT LOG

PROJECT TITLE: VTC - TR-3 WELL NO.: TR3-MW-2

PROJECT NO.:

STAFF: K. Stahl / S. Russo

DATE(S): 4/13/16

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	11.50	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	1.65	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.85	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	~~0~~ 0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.7	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	12	8"	2.60

OR
$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1	5	10	11	12						
pH	7.29	7.40	7.41	7.43	7.46						
SPEC. COND. (umhos)	1.91	1.91	1.91	1.87	1.85						
APPEARANCE	BRN	BRN	BRN	BRN	BRN						
TEMPERATURE (°C)	7.56	6.72	7.33	10.76	10.82						
Turbidity	>999	>999	>999	>999	>999						

COMMENTS:

Dry @ 10 gal removed. Allow To Recover and restART

Dry @ 1 gal Removed "

Dry @ 1 gal Removed. "

WELL DEVELOPMENT LOG

PROJECT TITLE: UTC - TR3 WELL NO.: TR3-PW-1

PROJECT NO.:

STAFF: K. Stabile / R. Russo

DATE(S): 4/13/16

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	28	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	12.56	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	15.44	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	10.2	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	35	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1	5	10	20	25	30	35				
pH	8.29	8.04	7.71	7.71	7.61	7.42	7.49				
SPEC. COND. (umhos)	1.30	1.33	1.32	1.42	1.67	1.22	1.13				
APPEARANCE	Brn	Brn	Brn	Brn	Brn	Brn	Brn				
TEMPERATURE (°C)	9.14	9.05	8.82	8.93	8.59	11.47	12.02				
TURB	>999	>999	>999	>999	>999	>999	921				

COMMENTS:

WELL DEVELOPMENT LOG

PROJECT TITLE: UTC-TR3 WELL NO.: TR3-PW-2

PROJECT NO.:

STAFF: K. Stahle R. Russo

DATE(S): 4-13-16

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	25.2	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	11.17	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	14.03	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.66	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	9.25	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	20	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1	5	10	15	20						
pH	7.66	7.63	7.66	7.69	7.68						
SPEC. COND. (umhos)	1.72	1.70	3.27	3.26	3.06						
APPEARANCE	Brn	Brn	Clear	Clear	Clear						
TEMPERATURE (°C)	12.37	12.45	12.00	11.26	11.13						
Turb	>999	>999	120	40.2	27.2						

COMMENTS:

WELL DEVELOPMENT LOG

PROJECT TITLE: UTC - TR-3 WELL NO.: TRS-GB-03

PROJECT NO.:

STAFF: K. Stahle

DATE(S): 4/12/16

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	≈ +7.5'	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=		3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=		4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=		5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	45	8"	2.60

OR
V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	15	30	45								
pH	7.45	7.65	7.67								
SPEC. COND. (umhos)	4.13	4.26	4.24								
APPEARANCE	RED	RED	RED								
TEMPERATURE (°C)	10.61	10.67	10.69								
TURB	836	>999	>999								

COMMENTS:

- Artesian well
- unable to insert water level meter

Appendix D – Well Purge/Sampling Logs

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: UTC - CARRIER Site: UTC-TR3 NJWELL Well I.D.: TR3-PW-1

Date: 4/18/16 Sampling Personnel: RM Company: _____

Purging/Sampling Device: Geopump Tubing Type: _____ Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 12.18 Depth to Well Bottom: 28.30 Well Diameter: 4" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 16.12 39.8 Estimated Purge Volume (liters): _____

Sample ID: TR3PW-1 Sample Time: 1710 QA/QC: —

Sample Parameters: VOCs, PCBs, PCBs(FILTERED)

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	ORP ~~Eh~~(mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1615	7.29	14.16	1.09	2.25	15.7	169	1000	12.18
1620	7.10	13.16	1.10	1.05	12.3	166	1000	13.10
1625	7.03	12.83	1.11	0.90	12.0	163	1000	13.65
1630	6.99	12.85	1.12	1.27	12.7	152	1000	14.28
1635	6.98	11.81	1.18	1.34	17.0	89	1000	14.85
1640	6.99	11.85	1.19	1.45	13.9	73	1000	14.18
1645	6.96	12.74	1.25	1.63	15.5	49	1000	14.46
1650	6.94	12.36	1.27	1.78	16.4	37	1000	14.79
1655	6.93	12.63	1.29	1.67	17.8	11	1000	15.19
1700	6.93	12.95	1.34	1.48	22.8	-6	1000	15.42
1705	6.93	12.01	1.36	1.04	27.3	-11	1000	16.72
1710	6.93	12.09	1.37	1.03	26.8	-16	1000	16.97
Tolerance:	0.1	—	3%	10%	10%	+ or - 10	—	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_y = \pi r^2 h$)

Remarks: Strong solvent odor on water.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: UTC - TR3 Site: Carrier Well I.D.: PW-2

Date: 4/19/16 Sampling Personnel: K. Stabile Company: AECOM

Purging/ Sampling Device: GeoPump Tubing Type: 3/8 Poly Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 11.35 Depth to Well Bottom: 25.3 Well Diameter: 4" Screen Length:

13.95

Casing Type: PVC Volume in 1 Well Casing (liters): 34.5 Estimated Purge Volume (liters):

Sample ID: TR3PW-2 Sample Time: 0905 QA/QC: —

Sample Parameters:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	ORP Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0800	(7.0)	11.88	2.28	2.51	29.4	-1	500	11.40
805	7.81	11.46	2.96	2.69	25.7	-96	500	11.42
810	7.60	11.21	2.51	2.07	24.2	-118	500	11.43
815	7.58	11.65	2.69	1.65	23.1	-121	500	11.42
820	7.55	10.84	2.92	1.57	22.0	-123	500	11.42
825	7.46	10.66	3.22	1.39	20.3	-119	500	11.43
830	7.42	10.41	3.60	1.22	19.5	-119	500	11.43
840	7.44	10.17	3.81	1.08	18.3	-121	500	11.43
850	7.55	9.89	4.17	0.95	16.8	-127	500	11.43
900	7.50	9.86	4.21	0.93	17.0	-125	500	11.43
905	7.48	9.84	4.22	0.92	16.7	-123	500	11.43
Tolerance:	0.1	—	3%	10%	10%	+ or - 10	—	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_y = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: UTC - TR3 Site: Carrier Well I.D.: TR3-MW-1

Date: 4/18/16 Sampling Personnel: K. Stahle Company: AECOM

Purging/ Sampling Device: Geopump Tubing Type: 5/8 Poly Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 0.91 Depth to Well Bottom: Well Diameter: 2" Screen Length:

Casing Type: PVC Volume in 1 Well Casing (liters): Estimated Purge Volume (liters):

Sample ID: TR3-MW-1 Sample Time: 1710 QA/QC:

Sample Parameters: VOC
RSK
TCL Filtered

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	ORP Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1640	7.18	17.07	3.09	2.18	23.1	6	200	2.30
1645	7.17	17.05	3.09	2.87	19.6	5	200	2.30
1650	7.17	16.99	3.09	2.87	14.2	8	200	2.30
1655	7.15	17.14	3.09	3.01	14.5	10	200	2.30
1700	7.14	17.28	3.09	3.46	14.8	12	200	2.30
1705	7.13	17.14	3.09	3.55	14.6	11	200	2.30
1710	7.13	17.05	3.09	3.56	14.4	7	200	2.30
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_c = \pi r^2 h$)

Remarks:

60480273

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: UTC - Carrier Syracuse Site: TR3 Well I.D.: TR3 MW-02

Date: 4-18-16 Sampling Personnel: Ron Russo JP Company: AECOM

Purging/Sampling Device: Geo Pump Tubing Type: 1/4 x 3/8 OD LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 2.08 Depth to Well Bottom: 11.71 Well Diameter: 2" Screen Length:

Casing Type: PVC Volume in 1 Well Casing (liters): 5.94L (1.56gal) Estimated Purge Volume (liters): 4

Sample ID: TR3-MW02 Sample Time: 17:07 QA/QC: No

Sample Parameters: VOCs
PCBs
PCB (filtered)

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	ORP Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
16:35	6.91	11.54	1.85	5.92	56.0	57	150	2.81
16:40	6.75	11.97	1.88	3.90	28.8	65	150	3.39
16:45	6.76	11.87	1.88	4.43	29.9	73	100	3.64
16:50	6.77	11.83	1.88	4.70	25.9	78	100	3.52
16:55	6.76	11.86	1.89	4.76	17.5	87	100	4.45
17:00	6.76	11.70	1.87	4.71	10.05	92	100	4.77
17:05	6.75	11.59	1.86	4.45	6.0	93	100	5.32
17:07	6.75	11.56	1.87	4.5	5.1	93	100	
Tolerance:	± 0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_v = \pi r^2 h$)

Remarks:

9.63 x 617 = 5,941 ml = 5.94 L
= 1.56 gallons

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: UTC Carrier Systems Site: TR3 Well I.D.: TR3-GB03

Date: 4-19-16 Sampling Personnel: Ron Russell / Keith Stahle Company: AECOM

Purging/Sampling Device: None - Hydrostar (low flow) Tubing Type: 1/4 x 3/8 LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 1' Depth to Well Bottom: 60' Well Diameter: 2" Screen Length:

Casing Type: PVC Volume in 1 Well Casing (liters): 36.4L Estimated Purge Volume (liters): 30 gallons

Sample ID: TR3-GB03 Sample Time: 9:10 QA/QC: No

Sample Parameters: VOCs, PCBs, PCBs (filtered)

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	ORP Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
8:50	7.12	10.45	4.71	4.65	477	275		
9:00	7.08	11.36	4.66	3.29	43.7	257		
Tolerance:	0.1	—	3%	10%	10%	+ or - 10	—	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{ft} = \pi r^2 h$)

Remarks: Purged 3 well volumes.

59' x 617 = 36,403 ml = 36 L

9.6 g

Appendix E
Data Usability Summary Report Narrative
(appendices are available on request)

DATA USABILITY SUMMARY REPORT

TR-3 NORTH WALL
UTC/CARRIER SITE
THOMPSON ROAD, SYRACUSE, NY
SITE ID# 734043

Analyses Performed by:

SGS ACCUTEST
MARLBOROUGH, MA

Prepared for:

UNITED TECHNOLOGIES CORP.
UTC SHARED REMEDIATION SERVICES
FARMINGTON, CT

Prepared by:

AECOM
257 WEST GENESEE STREET, SUITE 400
BUFFALO, NY 14202

JUNE 2016

TABLE OF CONTENTS

TABLES

(Following Text)

ATTACHMENTS

I. INTRODUCTION

This Data Usability Summary Report (DUSR) has been prepared following the guidelines provided in New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation *DER-10 Technical Guidance for Site Investigation and Remediation*, Appendix 2B - *Guidance for Data Deliverables and the Development of Data Usability Summary Reports,* May 2010.

II. ANALYTICAL METHODOLOGIES AND DATA VALIDATION PROCEDURES

The data being evaluated are from the January 12 – April 19, 2016 sampling of 54 soil samples, 2 field duplicates, 3 Matrix Spike/Matrix Spike Duplicate (MS/MSD) pairs, 5 groundwater samples, 2 equipment rinsate blanks, and 1 trip blank. All samples were sent to SGS Accutest located in Marlborough, MA and were analyzed for target compound list (TCL) volatile organic compounds (VOCs) following United States Environmental Protection Agency (USEPA) Method 8260C and TCL PCBs (total and dissolved) following USEPA Method 8082A. Not all samples were analyzed for all parameters.

A limited data validation was performed following the guidelines in the following USEPA Region II documents:

- *Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry, SW-846 Method 8260B*, SOP HW-24, Rev. 2, August 2008;
- *Polychlorinated Biphenyl (PCB) Aroclor Data Validation,* SOP HW-37, Rev. 3, May 2013

Qualifications applied to the data during the limited data validation include 'R' (rejected), 'J' (estimated concentration), 'U' (non-detect), and 'UJ' (estimated quantitation limit). Definitions of USEPA data qualifiers are presented at the end of this text. The validated analytical results are presented on Tables 1 – 9. Copies of marked-up laboratory analytical summaries (Form 1s) are presented in Attachment A on a per sample delivery group (SDG) basis. Documentation supporting the qualification of data is presented in Attachment B on a per sample delivery group basis. Only analytical deviations affecting data usability are discussed in this report.

III. DATA DELIVERABLE COMPLETENESS

Full deliverable data packages (i.e., NYSDEC Category B or equivalent) were provided by the laboratory, which included all reporting forms and raw data necessary to fully evaluate and verify the reported analytical results.

IV. SAMPLE RECEIPT/PRESERVATION/HOLDING TIMES

All samples were received by the laboratory intact, properly preserved and under proper chain-of-custody (COC). All samples were analyzed within the required holding times, except for the following instance:

- The initial VOC analysis of soil samples TR3-MW-02 (7-7.5), TR3-SB02 (8-10), TR3-SB03 (6-8), TR3-SB03 (8-10), and TR3-SB03 (12-14) occurred within the holding time. The laboratory re-analyzed the sample outside of the holding time due to a QC issue with carbon disulfide and vinyl chloride. Only the results of carbon disulfide and vinyl chloride are being reported from the re-analysis and have been qualified 'J' or 'UJ' due to the holding time exceedance.

- The initial analysis of groundwater sample TR3-MW-02 occurred within the holding time. The laboratory re-analyzed the sample outside of the holding time due to a QC issue with acetone. Only the results for acetone are being reported from the re-analyzed and have been qualified 'UJ' due to the holding time excedeence.

- The initial analysis of groundwater sample TR3-PW1 occurred with the holding time. The laboratory re-analyzed the sample at a dilution outside of the holding time due to an elevated level of cis-1,2-dichloroethene (cis-1,2-DCE) and trichloroethene (TCE). The result for these compounds have been qualified 'J'.

V. NON-CONFORMANCES

- **Surrogates**

  The %R of VOC surrogate 4-bromofluorobenzene and/or dibromofluoromethane was above the upper QC limit in some of the samples. The detected VOC results in the associated samples as listed on the surrogate recovery summary form were qualified 'J'.

Support documentation (i.e., surrogate recovery summary form) is presented in Appendix B.

- **Instrument Calibration**

The relative response factors (RRF) for acetone and/or methyl ethyl ketone (2-butanone) in the initial calibration (ICAL) and continuing calibration standards (CCAL) were below the QC limit of 0.100. The non-detect results for these compounds in the associated samples as listed on the instrument performance check forms were qualified 'R' and the detected compounds were qualified 'J'.

The percent difference (%D) between the ICAL average RRF and the RRF in one or more of the CCALs associated with the samples exceeded the QC limit of 20% for one or more of the following VOCs: 2-butanone, 1,1-dichloroethene, 2-hexanone, 1,1,1,-trichloroethane, acetone, bromodichloromethane, bromoform, bromomethane, carbon disulfide, carbon tetrachloride, chloroethane, chloroform, chloromethane, dibromochloromethane, dichlorodifluoromethane, ethylbenzene, styrene, tetrachloroethene, trans-1,2-dichloroethene, vinyl chloride, and/or total xylenes. The results for these compounds in the associated samples as listed on the instrument performance check forms were qualified 'J' or 'UJ'.

Support documentation (i.e., instrument performance check form, continuing calibration summary form) is provided in Attachment B.

- **Method Blanks**

VOCs methylene chloride and/or toluene were detected below the reporting limit (RL) in the laboratory method blanks associated with the samples. Those associated samples that had concentrations of this compound less than the RL were qualified 'U' at the RL.

Support documentation (i.e., method blank summary form, report of analysis form) is provided in Attachment B.

- **Equipment Rinsate Blanks (EB)**

VOC trichloroethene was detected below the QL in the EB associated with the samples. Those associated samples that had concentrations of this compound less than the RL were qualified 'U' at the RL.

- **Matrix Spike Blank (MSB)**

  The VOC MSB was above the QC limit for acetone. The detected results for this compound in the associated samples as listed on the blank spike summary form have been qualified 'J'.

- **Internal Standards (VOCs only)**

  The %Rs of VOC internal standard (IS) 1,4-dichlorobenzene-d_4 were below QC limits in the samples. The compounds associated with the IS outliers in the samples listed on the internal standard area summary form have been qualified 'UJ'.

- **Chromatography**

  The laboratory noted in the case narrative that some samples exhibited interference due to multiple aroclors being present with overlapping peaks. Those samples that are affected have been noted in the laboratory case narrative and on the Form Is. The affected aroclors have been qualified 'J' in accordance with the labs notation.

  The %Ds between the dual-column analyses for the samples exceeded QC limits (>25%) for one or more PCBs. The PCB results for the affected samples have been qualified 'J', 'NJ', 'U', or 'R' in accordance with the following validation guidelines.

% Difference	Qualifier
0-25%	none
26-100%	'J'
101-200% (interference detected)	'NJ'
>50% (value is < QL on both columns)	'U'
>200%	'R'

  Support documentation (i.e., GC Identification Summary forms) is provided in Attachment B.

- **Field Duplicates**

  Field duplicates were collected at sample locations GB-05 (15-17) and TR-SB-02 (12-14) and exhibited good field and analytical precision.

VI. SAMPLE RESULTS AND REPORTING

All quantitation/detection limits were reported in accordance with method requirements and were adjusted for sample volume, moisture content, and dilution factors. Results below the quantitation limits

were qualified 'J' by the laboratory. All quantitation limits were reported in accordance with method requirements and were adjusted for dilution factors.

Several samples required dilutions due to the nature of the sample matrix and/or high levels to target compounds. Those results reported from a secondary dilutions were qualified 'D'. The quantitation limits reported for the non-detect compounds are the lowest achievable at the diluted level.

VII. SUMMARY

All sample analyses were found to be compliant with the method and validation criteria, except where previously noted. Those results qualified 'R' are considered unusable. Those results qualified 'J', 'U', and 'UJ' are considered conditionally usable. All other sample results are usable as reported. URS does not recommend the recollection of any samples at this time.

Prepared By: Ann Marie Kropovitch, Chemist AMK **Date:** 6/28/16

Reviewed By: George E. Kisluk, Senior Chemist GEK **Date:** 6/28/16

DEFINITIONS OF USEPA DATA QUALIFIERS

U –	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J –	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
(J+) -	The result is an estimated quantity. The associated numerical value is biased high.
(J-) -	The result is an estimated quantity. The associated numerical value is biased low.
UJ –	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R –	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.
D –	The sample result was reported from a secondary dilution analysis.
NJ –	The analysis indicates the presence of an analyte that has been "tentatively identified' and the associated numerical value represents its approximate concentration.

TABLE 1
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43917
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-MW-01	TR3-MW-01	TR3-MW-01	TR3-MW-02	TR3-MW-02
Sample ID		MW-01-2-3	MW-01-3-4	MW-01-4-5	MW-02-3-4	MW-02-4-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-3.0	3.0-4.0	4.0-5.0	3.0-4.0	4.0-5.0
Date Sampled		01/12/16	01/12/16	01/12/16	01/12/16	01/12/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,1,2,2-Tetrachloroethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 UJ	2.2 U
1,1,2-Trichloroethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,1-Dichloroethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,1-Dichloroethene	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,2-Dichloroethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,2-Dichloroethene (cis)	UG/KG	0.95 J	0.91 J	2.6 U	2.0 U	2.2 U
1,2-Dichloroethene (trans)	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,2-Dichloropropane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,3-Dichloropropene (cis)	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
1,3-Dichloropropene (trans)	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
2-Hexanone	UG/KG	12 U	11 U	13 U	9.8 U	11 U
4-Methyl-2-pentanone	UG/KG	6.1 U	5.5 U	6.5 U	4.9 U	5.5 U
Acetone	UG/KG	37.5 J	28.0 J	6.5 J	23.9 J	6.8 J
Benzene	UG/KG	0.61 U	0.55 U	0.65 U	0.49 U	0.55 U
Bromodichloromethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Bromoform	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Bromomethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Carbon disulfide	UG/KG	0.88 J	5.5 U	1.9 J	1.7 J	5.5 U
Carbon tetrachloride	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Chlorobenzene	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Chloroethane	UG/KG	6.1 U	5.5 U	6.5 U	4.9 U	5.5 U
Chloroform	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 1
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43917
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-MW-01	TR3-MW-01	TR3-MW-01	TR3-MW-02	TR3-MW-02
Sample ID		MW-01-2-3	MW-01-3-4	MW-01-4-5	MW-02-3-4	MW-02-4-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		2.0-3.0	3.0-4.0	4.0-5.0	3.0-4.0	4.0-5.0
Date Sampled		01/12/16	01/12/16	01/12/16	01/12/16	01/12/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	6.1 U	5.5 U	6.5 U	4.9 U	5.5 U
Dibromochloromethane	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Ethylbenzene	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Xylene (total)	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Methyl ethyl ketone (2-Butanone)	UG/KG	R	R	R	R	R
Methylene chloride	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Styrene	UG/KG	6.1 U	5.5 U	6.5 U	4.9 U	5.5 U
Tetrachloroethene	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Toluene	UG/KG	6.1 U	5.5 U	6.5 U	4.9 U	5.5 U
Trichloroethene	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Vinyl chloride	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Xylene (total)	UG/KG	2.4 U	2.2 U	2.6 U	2.0 U	2.2 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	42 U	42 U	45 U	40 U	43 U
Aroclor 1221	UG/KG	42 U	42 U	45 U	40 U	43 U
Aroclor 1232	UG/KG	42 U	42 U	45 U	40 U	43 U
Aroclor 1242	UG/KG	42 U	42 U	45 U	40 U	43 U
Aroclor 1248	UG/KG	42 U	42 U	45 U	40 U	43 U
Aroclor 1254	UG/KG	42 U	42 U	45 U	40 U	43 U
Aroclor 1260	UG/KG	50.7	47.9	45 U	40 U	43 U
Total Polychlorinated Biphenyls	UG/KG	50.7	47.9	45 U	40 U	43 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 1
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43917
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-07	TR3-SB-07	TR3-SB-09	TR3-SB-09	TR3-SB-09
Sample ID		SB-07-3-4	SB-07-4-5	SB-09-1-2	SB-09-2-3	SB-09-3-4
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.0-4.0	4.0-5.0	1.0-2.0	2.0-3.0	3.0-4.0
Date Sampled		01/12/16	01/12/16	01/12/16	01/12/16	01/12/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
1,1,2,2-Tetrachloroethane	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
1,1,2-Trichloroethane	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
1,1-Dichloroethane	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
1,1-Dichloroethene	UG/KG	2.5 J	240 U	2.2 U	2.6 U	2.0 U
1,2-Dichloroethane	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
1,2-Dichloroethene (cis)	UG/KG	757 D	10,100	1.2 J	2.5 J	1.4 J
1,2-Dichloroethene (trans)	UG/KG	5.4 J	53.0 J	2.2 U	2.6 U	2.0 U
1,2-Dichloropropane	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
1,3-Dichloropropene (cis)	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
1,3-Dichloropropene (trans)	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
2-Hexanone	UG/KG	10 U	1,200 U	11 U	13 U	10 U
4-Methyl-2-pentanone	UG/KG	5.0 U	610 U	5.5 U	6.4 U	5.0 U
Acetone	UG/KG	10	1,200 U	70.8 J	19.3 J	29.3 J
Benzene	UG/KG	0.50 U	61 U	0.84	0.54 J	1.1
Bromodichloromethane	UG/KG	2.0 U	240 UJ	2.2 U	2.6 U	2.0 U
Bromoform	UG/KG	2.0 U	240 UJ	2.2 U	2.6 U	2.0 U
Bromomethane	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
Carbon disulfide	UG/KG	5.0 UJ	610 U	4.4 J	6.4 UJ	1.6 J
Carbon tetrachloride	UG/KG	2.0 U	240 UJ	2.2 U	2.6 U	2.0 U
Chlorobenzene	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
Chloroethane	UG/KG	5.0 U	610 U	5.5 U	6.4 U	5.0 U
Chloroform	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 1
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43917
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-07	TR3-SB-07	TR3-SB-09	TR3-SB-09	TR3-SB-09
Sample ID		SB-07-3-4	SB-07-4-5	SB-09-1-2	SB-09-2-3	SB-09-3-4
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		3.0-4.0	4.0-5.0	1.0-2.0	2.0-3.0	3.0-4.0
Date Sampled		01/12/16	01/12/16	01/12/16	01/12/16	01/12/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	5.0 U	610 U	5.5 U	6.4 U	5.0 U
Dibromochloromethane	UG/KG	2.0 U	240 UJ	2.2 U	2.6 U	2.0 U
Ethylbenzene	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
Xylene (total)	UG/KG	2.0 U	240 U	0.44 J	2.6 U	0.35 J
Methyl ethyl ketone (2-Butanone)	UG/KG	54.8 J	R	R	R	R
Methylene chloride	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
Styrene	UG/KG	5.0 U	610 U	5.5 U	6.4 U	5.0 U
Tetrachloroethene	UG/KG	2.0 U	240 U	2.2 U	2.6 U	2.0 U
Toluene	UG/KG	0.47 J	610 U	0.86 J	0.51 J	0.78 J
Trichloroethene	UG/KG	20.4	1,460	4.2	5.1	2.0
Vinyl chloride	UG/KG	156 J	513	2.2 U	2.6 U	2.0 U
Xylene (total)	UG/KG	2.0 U	240 U	0.44 J	2.6 U	0.35 J
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	38 U	39 U	46 U	41 U
Aroclor 1221	UG/KG	40 U	38 U	39 U	46 U	41 U
Aroclor 1232	UG/KG	40 U	38 U	39 U	46 U	41 U
Aroclor 1242	UG/KG	40 U	38 U	39 U	46 U	41 U
Aroclor 1248	UG/KG	40 U	38 U	39 U	46 U	41 U
Aroclor 1254	UG/KG	40 U	38 U	39 U	46 U	41 U
Aroclor 1260	UG/KG	40 U	38 U	199	47.5	41 U
Total Polychlorinated Biphenyls	UG/KG	40 U	38 U	199	47.5	41 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43937
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-PW-01	TR3-PW-01	TR3-PW-01
Sample ID		PW-1-14-16	PW-1-24-26	PW-1-26-28
Matrix		Soil	Soil	Soil
Depth Interval (ft)		14.0-16.0	24.0-26.0	26.0-28.0
Date Sampled		01/13/16	01/13/16	01/13/16
Parameter	Units			
Volatile Organic Compounds				
1,1,1-Trichloroethane	UG/KG	2.6 U	2,300 U	2,800 U
1,1,2,2-Tetrachloroethane	UG/KG	2.6 U	2,300 U	2,800 U
1,1,2-Trichloroethane	UG/KG	2.6 U	2,300 U	2,800 U
1,1-Dichloroethane	UG/KG	2.6 U	2,300 U	2,800 U
1,1-Dichloroethene	UG/KG	2.6 U	2,300 U	2,800 U
1,2-Dichloroethane	UG/KG	2.6 U	2,300 U	2,800 U
1,2-Dichloroethene (cis)	UG/KG	2.6 U	9,610	11,400
1,2-Dichloroethene (trans)	UG/KG	2.6 U	2,300 U	2,800 U
1,2-Dichloropropane	UG/KG	2.6 U	2,300 U	2,800 U
1,3-Dichloropropene (cis)	UG/KG	2.6 U	2,300 U	2,800 U
1,3-Dichloropropene (trans)	UG/KG	2.6 U	2,300 U	2,800 U
2-Hexanone	UG/KG	13 U	11,000 U	14,000 U
4-Methyl-2-pentanone	UG/KG	6.5 U	5,700 U	7,000 U
Acetone	UG/KG	16.2 J	11,000 U	14,000 U
Benzene	UG/KG	0.65 U	570 U	700 U
Bromodichloromethane	UG/KG	2.6 U	2,300 UJ	2,800 UJ
Bromoform	UG/KG	2.6 U	2,300 UJ	2,800 UJ
Bromomethane	UG/KG	2.6 U	2,300 U	2,800 U
Carbon disulfide	UG/KG	6.5 UJ	5,700 U	7,000 U
Carbon tetrachloride	UG/KG	2.6 U	2,300 UJ	2,800 UJ
Chlorobenzene	UG/KG	2.6 U	2,300 U	2,800 U
Chloroethane	UG/KG	6.5 U	5,700 U	7,000 U
Chloroform	UG/KG	2.6 U	2,300 U	2,800 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43937
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-PW-01	TR3-PW-01	TR3-PW-01
Sample ID		PW-1-14-16	PW-1-24-26	PW-1-26-28
Matrix		Soil	Soil	Soil
Depth Interval (ft)		14.0-16.0	24.0-26.0	26.0-28.0
Date Sampled		01/13/16	01/13/16	01/13/16
Parameter	Units			
Volatile Organic Compounds				
Chloromethane	UG/KG	6.5 U	5,700 U	7,000 U
Dibromochloromethane	UG/KG	2.6 U	2,300 UJ	2,800 UJ
Ethylbenzene	UG/KG	2.6 U	2,300 U	2,800 U
Methyl ethyl ketone (2-Butanone)	UG/KG	R	R	R
Methylene chloride	UG/KG	2.6 U	2,300 U	2,800 U
Styrene	UG/KG	6.5 U	5,700 U	7,000 U
Tetrachloroethene	UG/KG	2.6 U	1,070 J	3,380
Toluene	UG/KG	6.5 U	5,700 U	7,000 U
Trichloroethene	UG/KG	2.6 U	250,000	321,000
Vinyl chloride	UG/KG	2.6 U	2,300 U	2,800 U
Xylene (total)	UG/KG	2.6 U	2,300 U	2,800 U
Polychlorinated Biphenyls				
Aroclor 1016	UG/KG	42 U	40 U	40 U
Aroclor 1221	UG/KG	42 U	40 U	40 U
Aroclor 1232	UG/KG	42 U	40 U	40 U
Aroclor 1242	UG/KG	42 U	40 U	40 U
Aroclor 1248	UG/KG	42 U	40 U	40 U
Aroclor 1254	UG/KG	42 U	40 U	40 U
Aroclor 1260	UG/KG	42 U	40 U	40 U
Total Polychlorinated Biphenyls	UG/KG	42 U	40 U	40 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43960
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-PW-02	TR3-PW-02
Sample ID		PW-2-14-16	PW-2-23.4-24
Matrix		Soil	Soil
Depth Interval (ft)		14.0-16.0	23.5-24.0
Date Sampled		01/15/16	01/15/16
Parameter	Units		
Volatile Organic Compounds			
1,1,1-Trichloroethane	UG/KG	2.3 U	2.1 U
1,1,2,2-Tetrachloroethane	UG/KG	2.3 U	2.1 U
1,1,2-Trichloroethane	UG/KG	2.3 U	2.1 U
1,1-Dichloroethane	UG/KG	2.3 U	2.1 U
1,1-Dichloroethene	UG/KG	2.3 U	2.1 U
1,2-Dichloroethane	UG/KG	2.3 U	2.1 U
1,2-Dichloroethene (cis)	UG/KG	2.3 U	2.1 U
1,2-Dichloroethene (trans)	UG/KG	2.3 U	2.1 U
1,2-Dichloropropane	UG/KG	2.3 U	2.1 U
1,3-Dichloropropene (cis)	UG/KG	2.3 U	2.1 U
1,3-Dichloropropene (trans)	UG/KG	2.3 U	2.1 U
2-Hexanone	UG/KG	11 U	10 U
4-Methyl-2-pentanone	UG/KG	5.7 U	5.2 U
Acetone	UG/KG	19.3 J	10.9 J
Benzene	UG/KG	0.57 U	0.52 U
Bromodichloromethane	UG/KG	2.3 U	2.1 U
Bromoform	UG/KG	2.3 U	2.1 U
Bromomethane	UG/KG	2.3 U	2.1 U
Carbon disulfide	UG/KG	1.4 J	5.2 UJ
Carbon tetrachloride	UG/KG	2.3 U	2.1 U
Chlorobenzene	UG/KG	2.3 U	2.1 U
Chloroethane	UG/KG	5.7 UJ	5.2 UJ
Chloroform	UG/KG	2.3 U	2.1 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 3
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC43960
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-PW-02	TR3-PW-02
Sample ID		PW-2-14-16	PW-2-23.4-24
Matrix		Soil	Soil
Depth Interval (ft)		14.0-16.0	23.5-24.0
Date Sampled		01/15/16	01/15/16
Parameter	Units		
Volatile Organic Compounds			
Chloromethane	UG/KG	5.7 UJ	5.2 UJ
Dibromochloromethane	UG/KG	2.3 U	2.1 U
Ethylbenzene	UG/KG	2.3 UJ	2.1 UJ
Methyl ethyl ketone (2-Butanone)	UG/KG	R	R
Methylene chloride	UG/KG	2.3 U	2.1 U
Styrene	UG/KG	5.7 UJ	5.2 UJ
Tetrachloroethene	UG/KG	2.3 U	2.1 U
Toluene	UG/KG	5.7 U	5.2 U
Trichloroethene	UG/KG	10.5	2.1 U
Vinyl chloride	UG/KG	2.3 UJ	2.1 UJ
Xylene (total)	UG/KG	2.3 UJ	2.1 UJ
Polychlorinated Biphenyls			
Aroclor 1016	UG/KG	42 U	39 U
Aroclor 1221	UG/KG	42 U	39 U
Aroclor 1232	UG/KG	42 U	39 U
Aroclor 1242	UG/KG	42 U	39 U
Aroclor 1248	UG/KG	42 U	39 U
Aroclor 1254	UG/KG	42 U	39 U
Aroclor 1260	UG/KG	42 U	39 U
Total Polychlorinated Biphenyls	UG/KG	42 U	39 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44027
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-04	TR3-GB-04	TR3-GB-04	TR3-GB-05	TR3-GB-05
Sample ID		GB-04-9-11	GB-04-11-13	GB-04-13-15	GB-05-5-7	GB-05-7-9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		9.0-11.0	11.0-13.0	13.0-15.0	5.0-7.0	7.0-9.0
Date Sampled		01/19/16	01/19/16	01/19/16	01/19/16	01/19/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,1,2,2-Tetrachloroethane	UG/KG	2.5 U	2.3 U	2.4 UJ	2.0 U	2.0 U
1,1,2-Trichloroethane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,1-Dichloroethane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,1-Dichloroethene	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,2-Dichloroethane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,2-Dichloroethene (cis)	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,2-Dichloroethene (trans)	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,2-Dichloropropane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,3-Dichloropropene (cis)	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
1,3-Dichloropropene (trans)	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
2-Hexanone	UG/KG	12 U	12 U	12 U	10 U	9.8 U
4-Methyl-2-pentanone	UG/KG	6.2 U	5.8 U	5.9 U	5.1 U	4.9 U
Acetone	UG/KG	132 J	129 J	R	98.7 J	22.9 J
Benzene	UG/KG	0.62 U	0.58 U	1.4	0.51 U	0.49 U
Bromodichloromethane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Bromoform	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Bromomethane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Carbon disulfide	UG/KG	6.2 U	2.3 J	4.2 J	5.1 U	2.9 J
Carbon tetrachloride	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Chlorobenzene	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Chloroethane	UG/KG	6.2 U	5.8 U	5.9 U	5.1 U	4.9 U
Chloroform	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44027
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-04	TR3-GB-04	TR3-GB-04	TR3-GB-05	TR3-GB-05
Sample ID		GB-04-9-11	GB-04-11-13	GB-04-13-15	GB-05-5-7	GB-05-7-9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		9.0-11.0	11.0-13.0	13.0-15.0	5.0-7.0	7.0-9.0
Date Sampled		01/19/16	01/19/16	01/19/16	01/19/16	01/19/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	6.2 U	5.8 U	5.9 U	5.1 U	4.9 U
Dibromochloromethane	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Ethylbenzene	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Methyl ethyl ketone (2-Butanone)	UG/KG	R	13.1 J	7.8 J	12.8 J	R
Methylene chloride	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Styrene	UG/KG	6.2 U	5.8 U	5.9 U	5.1 U	4.9 U
Tetrachloroethene	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Toluene	UG/KG	6.2 U	5.8 U	2.4 J	5.1 U	4.9 U
Trichloroethene	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	6.7
Vinyl chloride	UG/KG	2.5 U	2.3 U	2.4 U	2.0 U	2.0 U
Xylene (total)	UG/KG	2.5 U	2.3 U	2.3 J	2.0 U	2.0 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	46 U	40 U	42 U	41 U	41 U
Aroclor 1221	UG/KG	46 U	40 U	42 U	41 U	41 U
Aroclor 1232	UG/KG	46 U	40 U	42 U	41 U	41 U
Aroclor 1242	UG/KG	46 U	40 U	42 U	41 U	41 U
Aroclor 1248	UG/KG	46 U	40 U	42 U	41 U	41 U
Aroclor 1254	UG/KG	46 U	40 U	42 U	41 U	41 U
Aroclor 1260	UG/KG	46 U	40 U	42 U	41 U	41 U
Total Polychlorinated Biphenyls	UG/KG	46 U	40 U	42 U	41 U	41 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44027
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-05	TR3-GB-05
Sample ID		FD-011916	GB-05-15-17
Matrix		Soil	Soil
Depth Interval (ft)		15.0-17.0	15.0-17.0
Date Sampled		01/19/16	01/19/16
Parameter	Units	Field Duplicate (1-1)	
Volatile Organic Compounds			
1,1,1-Trichloroethane	UG/KG	2.3 U	2.3 U
1,1,2,2-Tetrachloroethane	UG/KG	2.3 UJ	2.3 U
1,1,2-Trichloroethane	UG/KG	2.3 U	2.3 U
1,1-Dichloroethane	UG/KG	2.3 U	2.3 U
1,1-Dichloroethene	UG/KG	2.3 U	2.3 U
1,2-Dichloroethane	UG/KG	2.3 U	2.3 U
1,2-Dichloroethene (cis)	UG/KG	2.3 U	2.3 U
1,2-Dichloroethene (trans)	UG/KG	2.3 U	2.3 U
1,2-Dichloropropane	UG/KG	2.3 U	2.3 U
1,3-Dichloropropene (cis)	UG/KG	2.3 U	2.3 U
1,3-Dichloropropene (trans)	UG/KG	2.3 U	2.3 U
2-Hexanone	UG/KG	12 U	12 U
4-Methyl-2-pentanone	UG/KG	5.9 U	5.9 U
Acetone	UG/KG	19.4 J	19.0 J
Benzene	UG/KG	0.59 U	0.59 U
Bromodichloromethane	UG/KG	2.3 U	2.3 U
Bromoform	UG/KG	2.3 U	2.3 U
Bromomethane	UG/KG	2.3 U	2.3 U
Carbon disulfide	UG/KG	5.9 UJ	5.9 U
Carbon tetrachloride	UG/KG	2.3 U	2.3 U
Chlorobenzene	UG/KG	2.3 U	2.3 U
Chloroethane	UG/KG	5.9 U	5.9 U
Chloroform	UG/KG	2.3 U	2.3 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 4
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44027
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-05	TR3-GB-05
Sample ID		FD-011916	GB-05-15-17
Matrix		Soil	Soil
Depth Interval (ft)		15.0-17.0	15.0-17.0
Date Sampled		01/19/16	01/19/16
Parameter	Units	Field Duplicate (1-1)	
Volatile Organic Compounds			
Chloromethane	UG/KG	5.9 U	5.9 U
Dibromochloromethane	UG/KG	2.3 U	2.3 U
Ethylbenzene	UG/KG	2.3 U	2.3 U
Methyl ethyl ketone (2-Butanone)	UG/KG	R	R
Methylene chloride	UG/KG	2.3 U	2.3 U
Styrene	UG/KG	5.9 U	5.9 U
Tetrachloroethene	UG/KG	2.3 U	2.3 U
Toluene	UG/KG	5.9 U	5.9 U
Trichloroethene	UG/KG	2.3 U	2.3 U
Vinyl chloride	UG/KG	2.3 U	2.3 U
Xylene (total)	UG/KG	2.3 U	2.3 U
Polychlorinated Biphenyls			
Aroclor 1016	UG/KG	43 U	39 U
Aroclor 1221	UG/KG	43 U	39 U
Aroclor 1232	UG/KG	43 U	39 U
Aroclor 1242	UG/KG	43 U	39 U
Aroclor 1248	UG/KG	43 U	39 U
Aroclor 1254	UG/KG	43 U	39 U
Aroclor 1260	UG/KG	43 U	39 U
Total Polychlorinated Biphenyls	UG/KG	43 U	39 U

Flags assigned during chemistry validation are shown

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CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 5
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44103
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-01	TR3-GB-01	TR3-GB-02	TR3-GB-02	TR3-GB-03
Sample ID		GB-01-6-8	GB-01-16.8-17.2	GB-02-7-9	GB-02-13-15	GB-03-7-9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		6.0-8.0	16.8-17.2	7.0-9.0	13.0-15.0	7.0-9.0
Date Sampled		01/26/16	01/26/16	01/25/16	01/25/16	01/25/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,1,2,2-Tetrachloroethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,1,2-Trichloroethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,1-Dichloroethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,1-Dichloroethene	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,2-Dichloroethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,2-Dichloroethene (cis)	UG/KG	36.1	17,600	1.2 J	38,600	0.77 J
1,2-Dichloroethene (trans)	UG/KG	0.74 J	4,400 U	1.8 U	168 J	0.80 J
1,2-Dichloropropane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,3-Dichloropropene (cis)	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
1,3-Dichloropropene (trans)	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
2-Hexanone	UG/KG	8 U	22,000 U	9.0 U	2,900 U	11 U
4-Methyl-2-pentanone	UG/KG	4 U	11,000 U	4.5 U	1,500 U	5.0 U
Acetone	UG/KG	6.4 J	22,000 U	33.7 J	2,900 U	121 J
Benzene	UG/KG	0.41 U	1,100 U	0.54	150 U	0.73
Bromodichloromethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Bromoform	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Bromomethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Carbon disulfide	UG/KG	4 U	11,000 U	4.5 U	1,500 U	5.0 U
Carbon tetrachloride	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Chlorobenzene	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Chloroethane	UG/KG	4 U	11,000 U	4.5 U	1,500 U	5.0 U
Chloroform	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U

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Detection Limits shown are PQL

TABLE 5
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44103
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-01	TR3-GB-01	TR3-GB-02	TR3-GB-02	TR3-GB-03
Sample ID		GB-01-6-8	GB-01-16.8-17.2	GB-02-7-9	GB-02-13-15	GB-03-7-9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		6.0-8.0	16.8-17.2	7.0-9.0	13.0-15.0	7.0-9.0
Date Sampled		01/26/16	01/26/16	01/25/16	01/25/16	01/25/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	4 UJ	11,000 U	4.5 UJ	1,500 U	5.0 UJ
Dibromochloromethane	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Ethylbenzene	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Methyl ethyl ketone (2-Butanone)	UG/KG	R	R	R	R	R
Methylene chloride	UG/KG	1.6 U	4,400 U	1.8 U	590 U	2.1 U
Styrene	UG/KG	4 U	11,000 U	4.5 U	1,500 U	5.0 U
Tetrachloroethene	UG/KG	1.6 U	2,970 J	1.8 U	590 U	2.1 U
Toluene	UG/KG	4 U	11,000 U	4.5 U	1,500 U	1.2 J
Trichloroethene	UG/KG	20.6	1,120,000 D	0.67 J	590 U	1.3 J
Vinyl chloride	UG/KG	1.6 U	4,400 U	1.8 U	207 J	2.1 U
Xylene (total)	UG/KG	1.6 U	4,400 U	1.8 U	590 U	0.38 J
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	36 U	41 U	37 U	43 U	41 U
Aroclor 1221	UG/KG	36 U	41 U	37 U	43 U	41 U
Aroclor 1232	UG/KG	36 U	41 U	37 U	43 U	41 U
Aroclor 1242	UG/KG	36 U	41 U	37 U	43 U	41 U
Aroclor 1248	UG/KG	36 U	41 U	37 U	43 U	41 U
Aroclor 1254	UG/KG	56.8 J	23.0 J	25.9 J	43 U	38.2 J
Aroclor 1260	UG/KG	231	29.8 J	23.1 J	43 U	57.1
Total Polychlorinated Biphenyls	UG/KG	287.8 J	52.8 J	49 J	43 U	95.3 J

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Detection Limits shown are PQL

TABLE 5
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44103
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-03	TR3-GB-03
Sample ID		GB-03-9-11	GB-03-11-13
Matrix		Soil	Soil
Depth Interval (ft)		9.0-11.0	11.0-13.0
Date Sampled		01/25/16	01/25/16
Parameter	Units		
Volatile Organic Compounds			
1,1,1-Trichloroethane	UG/KG	2.0 U	1.8 U
1,1,2,2-Tetrachloroethane	UG/KG	2.0 U	1.8 U
1,1,2-Trichloroethane	UG/KG	2.0 U	1.8 U
1,1-Dichloroethane	UG/KG	2.0 U	1.8 U
1,1-Dichloroethene	UG/KG	2.0 U	1.8 U
1,2-Dichloroethane	UG/KG	2.0 U	1.8 U
1,2-Dichloroethene (cis)	UG/KG	0.79 J	1.8 U
1,2-Dichloroethene (trans)	UG/KG	2.0 U	1.8 U
1,2-Dichloropropane	UG/KG	2.0 U	1.8 U
1,3-Dichloropropene (cis)	UG/KG	2.0 U	1.8 U
1,3-Dichloropropene (trans)	UG/KG	2.0 U	1.8 U
2-Hexanone	UG/KG	9.0 U	9 U
4-Methyl-2-pentanone	UG/KG	4.0 U	4 U
Acetone	UG/KG	25.0 J	R
Benzene	UG/KG	0.49 U	0.46 U
Bromodichloromethane	UG/KG	2.0 U	1.8 U
Bromoform	UG/KG	2.0 U	1.8 U
Bromomethane	UG/KG	2.0 U	1.8 U
Carbon disulfide	UG/KG	4.0 U	4 U
Carbon tetrachloride	UG/KG	2.0 U	1.8 U
Chlorobenzene	UG/KG	2.0 U	1.8 U
Chloroethane	UG/KG	4.0 U	4 U
Chloroform	UG/KG	2.0 U	1.8 U

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TABLE 5
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44103
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-03	TR3-GB-03
Sample ID		GB-03-9-11	GB-03-11-13
Matrix		Soil	Soil
Depth Interval (ft)		9.0-11.0	11.0-13.0
Date Sampled		01/25/16	01/25/16
Parameter	Units		
Volatile Organic Compounds			
Chloromethane	UG/KG	4.0 UJ	4 UJ
Dibromochloromethane	UG/KG	2.0 U	1.8 U
Ethylbenzene	UG/KG	2.0 U	1.8 U
Methyl ethyl ketone (2-Butanone)	UG/KG	R	R
Methylene chloride	UG/KG	2.0 U	1.8 U
Styrene	UG/KG	4.0 U	4 U
Tetrachloroethene	UG/KG	2.0 U	1.8 U
Toluene	UG/KG	4.0 U	4 U
Trichloroethene	UG/KG	2.7	1.8 U
Vinyl chloride	UG/KG	2.0 U	1.8 U
Xylene (total)	UG/KG	2.0 U	1.8 U
Polychlorinated Biphenyls			
Aroclor 1016	UG/KG	41 U	39 U
Aroclor 1221	UG/KG	41 U	39 U
Aroclor 1232	UG/KG	41 U	39 U
Aroclor 1242	UG/KG	41 U	39 U
Aroclor 1248	UG/KG	41 U	39 U
Aroclor 1254	UG/KG	41 U	39 U
Aroclor 1260	UG/KG	41 U	39 U
Total Polychlorinated Biphenyls	UG/KG	41 U	39 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 6
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44155
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-02
Sample ID		GB-02-20-22
Matrix		Soil
Depth Interval (ft)		20.0-22.0
Date Sampled		01/28/16
Parameter	**Units**	
Volatile Organic Compounds		
1,1,1-Trichloroethane	UG/KG	2.5 U
1,1,2,2-Tetrachloroethane	UG/KG	2.5 U
1,1,2-Trichloroethane	UG/KG	2.5 U
1,1-Dichloroethane	UG/KG	2.5 U
1,1-Dichloroethene	UG/KG	2.5 U
1,2-Dichloroethane	UG/KG	2.5 U
1,2-Dichloroethene (cis)	UG/KG	2.5 U
1,2-Dichloroethene (trans)	UG/KG	2.5 U
1,2-Dichloropropane	UG/KG	2.5 U
1,3-Dichloropropene (cis)	UG/KG	2.5 U
1,3-Dichloropropene (trans)	UG/KG	2.5 U
2-Hexanone	UG/KG	13 U
4-Methyl-2-pentanone	UG/KG	6.3 U
Acetone	UG/KG	R
Benzene	UG/KG	0.63 U
Bromodichloromethane	UG/KG	2.5 U
Bromoform	UG/KG	2.5 U
Bromomethane	UG/KG	2.5 U
Carbon disulfide	UG/KG	6.3 U
Carbon tetrachloride	UG/KG	2.5 U
Chlorobenzene	UG/KG	2.5 U
Chloroethane	UG/KG	6.3 U
Chloroform	UG/KG	2.5 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

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[SITE KEY] = 1 AND [SDG] = 'MC44155'

TABLE 6
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC44155
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-02
Sample ID		GB-02-20-22
Matrix		Soil
Depth Interval (ft)		20.0-22.0
Date Sampled		01/28/16
Parameter	**Units**	
Volatile Organic Compounds		
Chloromethane	UG/KG	6.3 U
Dibromochloromethane	UG/KG	2.5 U
Ethylbenzene	UG/KG	2.5 U
Methyl ethyl ketone (2-Butanone)	UG/KG	R
Methylene chloride	UG/KG	2.5 U
Styrene	UG/KG	6.3 U
Tetrachloroethene	UG/KG	2.5 U
Toluene	UG/KG	6.3 U
Trichloroethene	UG/KG	2.5 U
Vinyl chloride	UG/KG	2.5 U
Xylene (total)	UG/KG	2.5 U
Polychlorinated Biphenyls		
Aroclor 1016	UG/KG	47 U
Aroclor 1221	UG/KG	47 U
Aroclor 1232	UG/KG	47 U
Aroclor 1242	UG/KG	47 U
Aroclor 1248	UG/KG	47 U
Aroclor 1254	UG/KG	47 U
Aroclor 1260	UG/KG	47 U
Total Polychlorinated Biphenyls	UG/KG	47 U

Flags assigned during chemistry validation are shown

MADE BY: AMK 6/27/16
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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-MW-02	TR3-SB-01	TR3-SB-01	TR3-SB-01	TR3-SB-02
Sample ID		TR3MW-02-7-7.5	TR3-SB01(1-2)	TR3-SB01(3-4)	TR3-SB01(10-12)	TR3-SB02 (8-10)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		7.0-7.5	1.0-2.0	3.0-4.0	10.0-12.0	8.0-10.0
Date Sampled		04/08/16	04/14/16	04/14/16	04/14/16	04/11/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	3.4 U	2.0 UJ	2.0 UJ	1,200 U	2.6 U
1,1,2,2-Tetrachloroethane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
1,1,2-Trichloroethane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
1,1-Dichloroethane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	1.1 J
1,1-Dichloroethene	UG/KG	3.4 UJ	2.0 U	2.0 U	1,200 U	1.0 J
1,2-Dichloroethane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
1,2-Dichloroethene (cis)	UG/KG	3.4 U	0.48 J	1.5 J	9,260	414
1,2-Dichloroethene (trans)	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	11.6
1,2-Dichloropropane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
1,3-Dichloropropene (cis)	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
1,3-Dichloropropene (trans)	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
2-Hexanone	UG/KG	17 UJ	10 U	13 U	6,200 UJ	13 UJ
4-Methyl-2-pentanone	UG/KG	8.5 U	5.0 U	6.6 U	3,100 U	6.4 U
Acetone	UG/KG	17 UJ	10 UJ	123 J	6,200 UR	271 J
Benzene	UG/KG	0.85 U	0.41 J	0.66 U	310 U	0.64 U
Bromodichloromethane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
Bromoform	UG/KG	3.4 U	2.0 U	2.0 UJ	1,200 U	2.6 U
Bromomethane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
Carbon disulfide	UG/KG	0.91 J	1.4 J	3.5 J	3,100 UJ	5.9 J
Carbon tetrachloride	UG/KG	3.4 UJ	2.0 UJ	2.0 UJ	1,200 U	2.6 UJ
Chlorobenzene	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
Chloroethane	UG/KG	8.5 U	5.0 U	6.6 U	3,100 U	6.4 U
Chloroform	UG/KG	3.4 U	0.53 J	2.0 U	1,200 U	2.6 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-MW-02	TR3-SB-01	TR3-SB-01	TR3-SB-01	TR3-SB-02
Sample ID		TR3MW-02-7-7.5	TR3-SB01(1-2)	TR3-SB01(3-4)	TR3-SB01(10-12)	TR3-SB02 (8-10)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		7.0-7.5	1.0-2.0	3.0-4.0	10.0-12.0	8.0-10.0
Date Sampled		04/08/16	04/14/16	04/14/16	04/14/16	04/11/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	8.5 UJ	5.0 U	6.6 U	3,100 U	6.4 UJ
Dibromochloromethane	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
Ethylbenzene	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
Methyl ethyl ketone (2-Butanone)	UG/KG	34 UJ	20 U	26 UJ	6,200 UR	17.5 J
Methylene chloride	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	0.70 J
Styrene	UG/KG	8.5 U	5.0 U	6.6 U	3,100 U	6.4 U
Tetrachloroethene	UG/KG	3.4 U	2.0 U	2.0 U	784 J	2.6 U
Toluene	UG/KG	8.5 U	5.0 U	6.6 U	3,100 U	6.4 U
Trichloroethene	UG/KG	3.4 U	13.2	4.3	197,000	2.5 J
Vinyl chloride	UG/KG	14.5 J	2.0 U	2.0 U	1,200 U	72.2 J
Xylene (total)	UG/KG	3.4 U	2.0 U	2.0 U	1,200 U	2.6 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	39 U	44 U	40 U	45 U
Aroclor 1221	UG/KG	40 U	39 U	44 U	40 U	45 U
Aroclor 1232	UG/KG	40 U	39 U	44 U	40 U	45 U
Aroclor 1242	UG/KG	40 U	39 U	44 U	40 U	45 U
Aroclor 1248	UG/KG	40 U	39 U	44 U	40 U	45 U
Aroclor 1254	UG/KG	40 U	39 U	44 U	40 U	45 U
Aroclor 1260	UG/KG	40 U	126	44 U	24.7 J	45 U
Total Polychlorinated Biphenyls	UG/KG	40 U	126	44 U	24.7 J	45 U

Flags assigned during chemistry validation are shown.

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CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-02	TR3-SB-02	TR3-SB-02	TR3-SB-03	TR3-SB-03
Sample ID		DUP-041116	TR3-SB02 (12-14)	TR3-SB02 (14-16)	TR3-SB03 (6-8)	TR3-SB03 (8-10)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		12.0-14.0	12.0-14.0	14.0-16.0	6.0-8.0	8.0-10.0
Date Sampled		04/11/16	04/11/16	04/11/16	04/11/16	04/11/16
Parameter	Units	Field Duplicate (1-1)				
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,1,2,2-Tetrachloroethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,1,2-Trichloroethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,1-Dichloroethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,1-Dichloroethene	UG/KG	1,400 U	2,500 U	2,600 U	2.5 UJ	2.6 UJ
1,2-Dichloroethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,2-Dichloroethene (cis)	UG/KG	15,400	22,200	9,160	3.0	175
1,2-Dichloroethene (trans)	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	6.3
1,2-Dichloropropane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,3-Dichloropropene (cis)	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
1,3-Dichloropropene (trans)	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
2-Hexanone	UG/KG	6,900 U	12,000 U	13,000 U	12 UJ	13 UJ
4-Methyl-2-pentanone	UG/KG	3,500 U	6,200 U	6,600 U	6.2 U	6.4 U
Acetone	UG/KG	6,900 UR	12,000 UR	13,000 UR	183 J	125 J
Benzene	UG/KG	350 U	620 U	660 U	0.60 J	0.64 U
Bromodichloromethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Bromoform	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Bromomethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Carbon disulfide	UG/KG	3,500 U	6,200 U	6,600 U	18.7 J	15.8 J
Carbon tetrachloride	UG/KG	1,400 U	2,500 U	2,600 U	2.5 UJ	2.6 UJ
Chlorobenzene	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Chloroethane	UG/KG	3,500 U	6,200 U	6,600 U	6.2 U	6.4 U
Chloroform	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-02	TR3-SB-02	TR3-SB-02	TR3-SB-03	TR3-SB-03
Sample ID		DUP-041116	TR3-SB02 (12-14)	TR3-SB02 (14-16)	TR3-SB03 (6-8)	TR3-SB03 (8-10)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		12.0-14.0	12.0-14.0	14.0-16.0	6.0-8.0	8.0-10.0
Date Sampled		04/11/16	04/11/16	04/11/16	04/11/16	04/11/16
Parameter	Units	Field Duplicate (1-1)				
Volatile Organic Compounds						
Chloromethane	UG/KG	3,500 U	6,200 U	6,600 U	6.2 UJ	6.4 UJ
Dibromochloromethane	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Ethylbenzene	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Methyl ethyl ketone (2-Butanone)	UG/KG	6,900 UR	12,000 UR	13,000 UR	25 UJ	13 UJ
Methylene chloride	UG/KG	1,400 U	2,500 U	2,600 U	0.68 J	2.6 U
Styrene	UG/KG	3,500 U	6,200 U	6,600 U	6.2 U	6.4 U
Tetrachloroethene	UG/KG	1,400 U	2,500 U	684 J	2.5 U	2.6 U
Toluene	UG/KG	3,500 U	6,200 U	6,600 U	0.85 J	6.4 U
Trichloroethene	UG/KG	151,000	225,000	292,000	15.6	13.1
Vinyl chloride	UG/KG	1,400 U	2,500 U	2,600 U	2.5 UJ	86.0 J
Xylene (total)	UG/KG	1,400 U	2,500 U	2,600 U	2.5 U	2.6 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	39 U	41 U	42 U	42 U	46 U
Aroclor 1221	UG/KG	39 U	41 U	42 U	42 U	46 U
Aroclor 1232	UG/KG	39 U	41 U	42 U	42 U	46 U
Aroclor 1242	UG/KG	39 U	41 U	42 U	42 U	46 U
Aroclor 1248	UG/KG	39 U	41 U	42 U	42 U	46 U
Aroclor 1254	UG/KG	39 U	41 U	42 U	198 J	46 U
Aroclor 1260	UG/KG	39 U	41 U	42 U	244	46 U
Total Polychlorinated Biphenyls	UG/KG	39 U	41 U	42 U	442 J	46 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-03	TR3-SB-04	TR3-SB-04	TR3-SB-04	TR3-SB-07
Sample ID		TR3-SB03 (12-14)	TR3-SB04 (5-6.5)	TR3-SB04 (6.5-8)	TR3-SB04 (8.5-10.5)	TR3-SB07(5.5-6.5)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		12.0-14.0	5.0-6.5	6.5-8.0	8.5-10.5	5.5-6.5
Date Sampled		04/11/16	04/11/16	04/11/16	04/11/16	04/14/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	2.0 U	1.9 UJ	210 U	250 U	230 U
1,1,2,2-Tetrachloroethane	UG/KG	2.0 UJ	1.9 U	210 U	250 U	230 U
1,1,2-Trichloroethane	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
1,1-Dichloroethane	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
1,1-Dichloroethene	UG/KG	2.0 UJ	1.9 U	210 U	250 U	230 U
1,2-Dichloroethane	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
1,2-Dichloroethene (cis)	UG/KG	3.4 J	1.6 J	1,000	13,700	11,800
1,2-Dichloroethene (trans)	UG/KG	2.0 U	0.48 J	210 U	250 U	61.7 J
1,2-Dichloropropane	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
1,3-Dichloropropene (cis)	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
1,3-Dichloropropene (trans)	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
2-Hexanone	UG/KG	9.9 UJ	9.4 UJ	1,100 U	1,200 U	1,200 UJ
4-Methyl-2-pentanone	UG/KG	5.0 U	4.7 U	530 U	610 U	580 U
Acetone	UG/KG	9.9 UJ	210 J	1,100 UR	1,200 UR	1,200 UR
Benzene	UG/KG	0.50 U	0.60	53 U	61 U	58 U
Bromodichloromethane	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Bromoform	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Bromomethane	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Carbon disulfide	UG/KG	0.74 J	3.1 J	530 U	610 U	580 U
Carbon tetrachloride	UG/KG	2.0 UJ	1.9 UJ	210 U	250 U	230 UJ
Chlorobenzene	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Chloroethane	UG/KG	5.0 U	4.7 U	530 U	610 U	580 U
Chloroform	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U

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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-03	TR3-SB-04	TR3-SB-04	TR3-SB-04	TR3-SB-07
Sample ID		TR3-SB03 (12-14)	TR3-SB04 (5-6.5)	TR3-SB04 (6.5-8)	TR3-SB04 (8.5-10.5)	TR3-SB07(5.5-6.5)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		12.0-14.0	5.0-6.5	6.5-8.0	8.5-10.5	5.5-6.5
Date Sampled		04/11/16	04/11/16	04/11/16	04/11/16	04/14/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	5.0 UJ	4.7 U	530 U	610 U	580 UJ
Dibromochloromethane	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Ethylbenzene	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Methyl ethyl ketone (2-Butanone)	UG/KG	20 UJ	19.2 J	1,100 UR	1,200 UR	1,550 J
Methylene chloride	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Styrene	UG/KG	5.0 U	4.7 U	530 U	610 U	580 U
Tetrachloroethene	UG/KG	2.0 U	1.9 U	210 U	250 U	230 UJ
Toluene	UG/KG	5.0 U	4.7 U	530 U	610 U	580 U
Trichloroethene	UG/KG	2.0 U	1.4 J	210 U	250 U	11,300
Vinyl chloride	UG/KG	41.7 J	1.9 UJ	398	2,240	230 U
Xylene (total)	UG/KG	2.0 U	1.9 U	210 U	250 U	230 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	39 U	39 U	38 U	41 U	40 U
Aroclor 1221	UG/KG	39 U	39 U	38 U	41 U	40 U
Aroclor 1232	UG/KG	39 U	39 U	38 U	41 U	40 U
Aroclor 1242	UG/KG	39 U	39 U	38 U	41 U	40 U
Aroclor 1248	UG/KG	39 U	39 U	38 U	41 U	40 U
Aroclor 1254	UG/KG	39 U	80.2 J	38 U	41 U	40 U
Aroclor 1260	UG/KG	39 U	111	38 U	41 U	40 U
Total Polychlorinated Biphenyls	UG/KG	39 U	191.2 J	38 U	41 U	40 U

Flags assigned during chemistry validation are shown.

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CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-07	TR3-SB-08	TR3-SB-08	TR3-SB-08	TR3-SB-10
Sample ID		TR3-SB07(9-10)	TR3-SB08 (5-6)	TR3-SB08 (8-10)	TR3-SB08 (12-13)	TR3-SB10 (6-8)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		9.0-10.0	5.0-6.0	8.0-10.0	12.0-13.0	6.0-8.0
Date Sampled		04/14/16	04/11/16	04/11/16	04/11/16	04/11/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
1,1,2,2-Tetrachloroethane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 UJ	2.6 U
1,1,2-Trichloroethane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
1,1-Dichloroethane	UG/KG	1,300 U	2.0 U	0.74 J	2.3 U	2.6 U
1,1-Dichloroethene	UG/KG	1,300 U	2.0 UJ	1.9 UJ	2.3 UJ	2.6 UJ
1,2-Dichloroethane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
1,2-Dichloroethene (cis)	UG/KG	48,800	2.0 U	1.9 U	2.3 U	1.2 J
1,2-Dichloroethene (trans)	UG/KG	314 J	2.0 U	1.9 U	2.3 U	2.6 U
1,2-Dichloropropane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
1,3-Dichloropropene (cis)	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
1,3-Dichloropropene (trans)	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
2-Hexanone	UG/KG	6,700 UJ	9.9 UJ	9.4 UJ	12 UJ	13 UJ
4-Methyl-2-pentanone	UG/KG	3,400 U	5.0 U	4.7 U	5.8 U	6.5 U
Acetone	UG/KG	6,700 UR	112 J	203 J	104 J	160 J
Benzene	UG/KG	340 U	0.64	0.72	0.58 U	0.65 U
Bromodichloromethane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
Bromoform	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
Bromomethane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
Carbon disulfide	UG/KG	3,400 U	1.4 J	0.70 J	0.58 J	0.92 J
Carbon tetrachloride	UG/KG	1,300 UJ	2.0 UJ	1.9 UJ	2.3 UJ	2.6 UJ
Chlorobenzene	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
Chloroethane	UG/KG	3,400 U	5.0 U	4.7 U	5.8 U	6.5 U
Chloroform	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U

Flags assigned during chemistry validation are shown

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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-07	TR3-SB-08	TR3-SB-08	TR3-SB-08	TR3-SB-10
Sample ID		TR3-SB07(9-10)	TR3-SB08 (5-6)	TR3-SB08 (8-10)	TR3-SB08 (12-13)	TR3-SB10 (6-8)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		9.0-10.0	5.0-6.0	8.0-10.0	12.0-13.0	6.0-8.0
Date Sampled		04/14/16	04/11/16	04/11/16	04/11/16	04/11/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	3,400 UJ	5.0 UJ	4.7 UJ	5.8 UJ	6.5 UJ
Dibromochloromethane	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
Ethylbenzene	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
Methyl ethyl ketone (2-Butanone)	UG/KG	6,700 UR	20 UJ	19 UJ	23 UJ	26 UJ
Methylene chloride	UG/KG	1,300 U	2.0 U	0.64 J	2.3 U	2.6 U
Styrene	UG/KG	3,400 U	5.0 U	4.7 U	5.8 U	6.5 U
Tetrachloroethene	UG/KG	1,300 UJ	2.0 U	1.9 U	2.3 U	2.6 U
Toluene	UG/KG	3,400 U	0.65 J	0.91 J	5.8 U	6.5 U
Trichloroethene	UG/KG	219,000	2.0 U	1.9 U	2.3 U	2.6 U
Vinyl chloride	UG/KG	1,300 U	2.0 UJ	1.9 UJ	2.3 UJ	2.6 UJ
Xylene (total)	UG/KG	1,300 U	2.0 U	1.9 U	2.3 U	2.6 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	40 U	40 U	39 U	41 U	44 U
Aroclor 1221	UG/KG	40 U	40 U	39 U	41 U	44 U
Aroclor 1232	UG/KG	40 U	40 U	39 U	41 U	44 U
Aroclor 1242	UG/KG	40 U	40 U	39 U	41 U	44 U
Aroclor 1248	UG/KG	40 U	40 U	39 U	41 U	44 U
Aroclor 1254	UG/KG	40 U	40 U	39 U	41 U	223
Aroclor 1260	UG/KG	40 U	40 U	39 U	41 U	106 J
Total Polychlorinated Biphenyls	UG/KG	40 U	40 U	39 U	41 U	329 J

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-10	TR3-SB-10	TR3-SB-11	TR3-SB-11	TR3-SB-11
Sample ID		TR3-SB10 (8-10)	TR3-SB10 (12-14)	TR3-SB11(4-8)	TR3-SB11(8-12)	TR3-SB11(13-14)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		8.0-10.0	12.0-14.0	4.0-8.0	8.0-12.0	13.0-14.0
Date Sampled		04/11/16	04/11/16	04/14/16	04/14/16	04/14/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/KG	2.1 U	2.2 UJ	210 U	1.8 UJ	1.9 UJ
1,1,2,2-Tetrachloroethane	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 UJ
1,1,2-Trichloroethane	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
1,1-Dichloroethane	UG/KG	2.1 U	7.0	210 U	1.8 U	1.9 U
1,1-Dichloroethene	UG/KG	2.1 UJ	2.2 U	210 U	1.8 U	1.9 U
1,2-Dichloroethane	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
1,2-Dichloroethene (cis)	UG/KG	2.1 U	27.0	287	1.8 U	1.9 U
1,2-Dichloroethene (trans)	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
1,2-Dichloropropane	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
1,3-Dichloropropene (cis)	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
1,3-Dichloropropene (trans)	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
2-Hexanone	UG/KG	11 UJ	11 UJ	1,100 UJ	9.1 U	9.6 U
4-Methyl-2-pentanone	UG/KG	5.4 U	5.5 U	530 U	4.6 U	4.8 U
Acetone	UG/KG	76.7 J	284 J	1,100 UR	9.1 UJ	9.6 UJ
Benzene	UG/KG	0.54 U	0.55	53 U	0.46 U	0.48 U
Bromodichloromethane	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Bromoform	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Bromomethane	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Carbon disulfide	UG/KG	1.1 J	5.5 U	530 UJ	1.1 J	0.63 J
Carbon tetrachloride	UG/KG	2.1 UJ	2.2 UJ	210 U	1.8 UJ	1.9 UJ
Chlorobenzene	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Chloroethane	UG/KG	5.4 U	5.5 U	530 U	4.6 U	4.8 U
Chloroform	UG/KG	2.1 U	2.2 U	210 U	1.8 UJ	1.9 UJ

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 7
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS - SDG MC45288
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-SB-10	TR3-SB-10	TR3-SB-11	TR3-SB-11	TR3-SB-11
Sample ID		TR3-SB10 (8-10)	TR3-SB10 (12-14)	TR3-SB11(4-8)	TR3-SB11(8-12)	TR3-SB11(13-14)
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		8.0-10.0	12.0-14.0	4.0-8.0	8.0-12.0	13.0-14.0
Date Sampled		04/11/16	04/11/16	04/14/16	04/14/16	04/14/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/KG	5.4 UJ	5.5 U	530 U	4.6 U	4.8 U
Dibromochloromethane	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Ethylbenzene	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Methyl ethyl ketone (2-Butanone)	UG/KG	21 UJ	25.1 J	1,100 UR	18 U	19 U
Methylene chloride	UG/KG	2.1 U	2.2 U	210 U	1.1 J	1.9 U
Styrene	UG/KG	5.4 U	5.5 U	530 U	4.6 U	4.8 U
Tetrachloroethene	UG/KG	2.1 U	2.2 U	210 UJ	1.8 U	1.9 U
Toluene	UG/KG	5.4 U	5.5 U	530 U	4.6 U	4.8 U
Trichloroethene	UG/KG	2.1 U	2.2 U	514	1.8 U	1.9 U
Vinyl chloride	UG/KG	2.1 UJ	40.3 J	210 U	1.8 U	1.9 U
Xylene (total)	UG/KG	2.1 U	2.2 U	210 U	1.8 U	1.9 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	41 U	40 U	37 U	41 U	41 U
Aroclor 1221	UG/KG	41 U	40 U	37 U	41 U	41 U
Aroclor 1232	UG/KG	41 U	40 U	37 U	41 U	41 U
Aroclor 1242	UG/KG	41 U	40 U	37 U	41 U	41 U
Aroclor 1248	UG/KG	41 U	40 U	37 U	41 U	41 U
Aroclor 1254	UG/KG	41 U	40 U	23.1 J	41 U	41 U
Aroclor 1260	UG/KG	41 U	40 U	40.4	41 U	41 U
Total Polychlorinated Biphenyls	UG/KG	41 U	40 U	63.5 J	41 U	41 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 8
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-03	TR3-MW-01	TR3-MW-02	TR3-PW-01	TR3-PW-02
Sample ID		TR3-GB-03	TR3-MW01	TR3-MW02	TR3-PW1	TR3-PW-2
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		04/19/16	04/18/16	04/18/16	04/18/16	04/19/16
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	UG/L	1.0 U	1.0 U	1.0 U	1.9	1.0 U
1,1-Dichloroethene	UG/L	1.0 U	1.0 U	1.0 U	136	1.0 U
1,2-Dichloroethane	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	UG/L	1.0 U	1.0 U	1.0 U	12,500 DJ	1.0 U
1,2-Dichloroethene (trans)	UG/L	1.0 U	1.0 U	1.0 U	47.6	1.0 U
1,2-Dichloropropane	UG/L	2.0 U	2.8 U	2.0 U	2.0 U	2 U
1,3-Dichloropropene (cis)	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichloropropene (trans)	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Hexanone	UG/L	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Acetone	UG/L	R	R	10 UJ	18.8 J	10 UJ
Benzene	UG/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	UG/L	2.0 U	2.8 U	2.0 U	2.0 U	2 U
Carbon disulfide	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Carbon tetrachloride	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	UG/L	2.0 U	2.8 U	2.0 U	2.0 U	2 U
Chloroform	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

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TABLE 8
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-03	TR3-MW-01	TR3-MW-02	TR3-PW-01	TR3-PW-02
Sample ID		TR3-GB-03	TR3-MW01	TR3-MW02	TR3-PW1	TR3-PW-2
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		04/19/16	04/18/16	04/18/16	04/18/16	04/19/16
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/L	2.0 UJ	2.8 UJ	2.0 UJ	2.0 UJ	2 UJ
Dibromochloromethane	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	UG/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl ethyl ketone (2-Butanone)	UG/L	R	R	R	R	R
Methylene chloride	UG/L	2.0 U	2.8 U	2.0 U	2.0 U	2 U
Styrene	UG/L	5.0 U	5.0 U	5.0 U	5.0 U	5 U
Tetrachloroethene	UG/L	1.0 U	1.0 U	1.0 U	77.6	1.0 U
Toluene	UG/L	1.0 U	1.0 U	1.0 U	2.1	1.0 U
Trichloroethene	UG/L	0.71 J	1.0 U	1.0 U	195,000 DJ	2.0
Vinyl chloride	UG/L	1.0 UJ	1.0 UJ	1.3 J	107 J	1.0 UJ
Xylene (total)	UG/L	1.0 U	1.0 U	1.0 U	1.0	1.0 U
Polychlorinated Biphenyls						
Aroclor 1016	UG/L	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Aroclor 1221	UG/L	0.17 U	0.16 U	0.26 U	0.16 U	0.16 U
Aroclor 1232	UG/L	0.17 U	0.16 U	0.26 U	0.16 U	0.16 U
Aroclor 1242	UG/L	0.16 U	0.16 U	0.26 U	0.16 U	0.16 U
Aroclor 1248	UG/L	0.17 U	0.16 U	0.26 U	0.16 U	0.16 U
Aroclor 1254	UG/L	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Aroclor 1260	UG/L	0.17 U	0.16 U	0.26 U	0.16 U	0.16 U
Dissolved Polychlorinated Biphenyls						
Aroclor 1016	UG/L	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U
Aroclor 1221	UG/L	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U
Aroclor 1232	UG/L	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 8
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		TR3-GB-03	TR3-MW-01	TR3-MW-02	TR3-PW-01	TR3-PW-02
Sample ID		TR3-GB-03	TR3-MW01	TR3-MW02	TR3-PW1	TR3-PW-2
Matrix		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)		-	-	-	-	-
Date Sampled		04/19/16	04/18/16	04/18/16	04/18/16	04/19/16
Parameter	Units					
Dissolved Polychlorinated Biphenyls						
Aroclor 1242	UG/L	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U
Aroclor 1248	UG/L	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U
Aroclor 1254	UG/L	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U
Aroclor 1260	UG/L	0.17 U	0.16 U	0.26 U	0.16 U	0.16 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 6/27/16
CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

TABLE 9
VALIDATED FIELD QC SAMPLE ANALYTICAL RESULTS
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		FIELDQC	FIELDQC	FIELDQC
Sample ID		RB-011416	RB-041416	TB-041916
Matrix		Water Quality	Water Quality	Water Quality
Depth Interval (ft)		-	-	-
Date Sampled		01/14/16	04/14/16	04/19/16
Parameter	Units	Rinse Blank (1-1)	Rinse Blank (1-1)	Trip Blank (1-1)
Volatile Organic Compounds				
1,1,1-Trichloroethane	UG/L	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	UG/L	0.5 U	0.50 U	0.5 U
1,1,2-Trichloroethane	UG/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	UG/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	UG/L	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethane	UG/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (cis)	UG/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (trans)	UG/L	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	UG/L	2 U	2.0 U	2.0 U
1,3-Dichloropropene (cis)	UG/L	0.5 U	1.0 U	0.5 U
1,3-Dichloropropene (trans)	UG/L	0.5 U	0.50 U	0.5 U
2-Hexanone	UG/L	10 U	10 U	10 U
4-Methyl-2-pentanone	UG/L	5 U	5.0 U	5.0 U
Acetone	UG/L	10 U	R	R
Benzene	UG/L	0.5 U	0.50 U	0.5 U
Bromodichloromethane	UG/L	1.0 U	1.0 U	1.0 U
Bromoform	UG/L	1.0 U	1.0 U	1.0 U
Bromomethane	UG/L	2 U	2.0 UJ	2.0 U
Carbon disulfide	UG/L	5 U	5.0 UJ	5.0 U
Carbon tetrachloride	UG/L	1.0 U	1.0 U	1.0 U
Chlorobenzene	UG/L	1.0 U	1.0 U	1.0 U
Chloroethane	UG/L	2 U	2.0 U	2.0 U
Chloroform	UG/L	1.0 U	1.0 U	1.0 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

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TABLE 9
VALIDATED FIELD QC SAMPLE ANALYTICAL RESULTS
TR-3 NORTH WALL
UTC/CARRIER SITE

Location ID		FIELDQC	FIELDQC	FIELDQC
Sample ID		RB-011416	RB-041416	TB-041916
Matrix		Water Quality	Water Quality	Water Quality
Depth Interval (ft)		-	-	-
Date Sampled		01/14/16	04/14/16	04/19/16
Parameter	Units	Rinse Blank (1-1)	Rinse Blank (1-1)	Trip Blank (1-1)
Volatile Organic Compounds				
Chloromethane	UG/L	2 U	2.0 UJ	2.0 UJ
Dibromochloromethane	UG/L	1.0 U	1.0 U	1.0 U
Ethylbenzene	UG/L	1.0 U	1.0 U	1.0 U
Methyl ethyl ketone (2-Butanone)	UG/L	10 U	R	R
Methylene chloride	UG/L	1.7 J	2.0 U	2.0 U
Styrene	UG/L	5 U	5.0 U	5.0 U
Tetrachloroethene	UG/L	1.0 U	1.0 U	1.0 U
Toluene	UG/L	1.0 U	1.0 U	1.0 U
Trichloroethene	UG/L	0.34 J	1.0 U	1.0 U
Vinyl chloride	UG/L	1.0 U	1.0 U	1.0 UJ
Xylene (total)	UG/L	1.0 U	1.0 U	1.0 U
Polychlorinated Biphenyls				
Aroclor 1016	UG/L	0.26 U	0.27 U	NA
Aroclor 1221	UG/L	0.26 U	0.27 U	NA
Aroclor 1232	UG/L	0.26 U	0.27 U	NA
Aroclor 1242	UG/L	0.26 U	0.27 U	NA
Aroclor 1248	UG/L	0.26 U	0.27 U	NA
Aroclor 1254	UG/L	0.26 U	0.27 U	NA
Aroclor 1260	UG/L	0.26 U	0.27 U	NA

Flags assigned during chemistry validation are shown.

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CHECKED BY: GEK 6/28/16

Detection Limits shown are PQL

Appendix F

Pumping Test and Hydraulic Conductivity Testing Calculations

1.1 Pumping Tests

Pumping tests were conducted using the two new 4-inch diameter unconfined water-bearing zone wells (TR3-PW-1 and TR3-PW-2), two existing 2-inch diameter unconfined water-bearing zone monitoring wells (MW-50 and MW-62), and existing confined water-bearing zone well MW-54D. The pump test methods are discussed below.

Unconfined Water-Bearing Zone Pumping Tests

The pumping tests were performed using a Grundfos Redi-flo 2 submersible pump and In-Situ Level TROLL 700 pressure transducers to monitor water levels in the pumping well and in nearby monitoring wells. The tests at TR3-PW-2, MW-50, and MW-62 were run for approximately 7 hours with 2 hours recovery at the end of pumping. Pumping at TR3-PW-1 was terminated after 2 hours because the very low flow rate could not be maintained by the pump. Water recovered during the pumping tests was conveyed to the SWTB for treatment.

In addition, rising and falling head slug tests were performed on the four shallow pumping wells to determine hydraulic conductivity and supplement the pump test data.

Confined Water-Bearing Zone Pumping Test

Monitoring well MW-54D is previously installed in the confined lower water-bearing zone. The boring log from this well indicates that two sand layers underlay the confining clay layer from approximately 35 to 40 ft bgs and from 44.5 to 46 ft bgs. Similar to the unconfined water-bearing zone pumping tests, the pumping test performed in the lower water-bearing zone pumping from MW-54D used a small diameter pump capable of fitting within a 2-inch well and pressure transducers installed to monitor water levels in the pumping well, the newly-installed deep well (TR3-GB-03) and in MW-14D (an existing deep well). Because of artesian conditions, temporary extensions were installed on the deep well risers during the pump test. This pumping test was conducted for a total of 6 hours with 2 hours recovery at the end of pumping. Water recovered during the pumping test was conveyed to the SWTB for treatment.

Nearby shallow monitoring wells were also monitored with pressure transducers to determine the degree of hydraulic connection, if any, between the unconfined and confined water-bearing zones.

During these tests, the water level was also monitored in Sanders Creek both upstream and downstream using surveyed measuring points.

1.2 Pumping and Slug Test Results

Pumping and slug test data was analyzed with Aqtesolv, an industry standard program with a variety of solutions including those for confined, unconfined, and leaky aquifer conditions. Five (5) pumping tests and four (4) slug tests were analyzed.

Assumptions

The assumptions for the analytical methods include an isotropic aquifer of infinite aerial extent, no boundaries and simple stratigraphy although vertical anisotropy can be included. The UTC Syracuse site has a complex surficial geology which makes pumping and slug test analyses a challenge. Hence, several methods have been used to assess aquifer parameters.

Results

The results of the analyses are shown in **Table 1**. Aquifer parameters derived from pumping include transmissivity T, storativity S, and specific yield (drainable porosity) S_y although not all methods produce both storage parameters. From the values of transmissivity T, hydraulic conductivity, K, is produced by dividing T by aquifer saturated thickness, b. Hydraulic conductivity, K, is derived from slug tests.

Table 1: Results of Pumping and Slug Tests

Well	T (m^2/day)	b (ft.)	b (m)	K (m/sec)	S	Sy	Method
PW2 PUMPING TEST							
PW2	3.3E-06	12.54	3.82	8.6E-07	0.1	0.17	Moench
MW50	2.1E-04	12.54	3.82	5.5E-05	0.0062	0.23	Moench
MW58	1.0E-03	12.54	3.82	2.6E-04	0.0012	0.001	Moench
MW67	4.4E-04	12.54	3.82	1.2E-04	2.70E-09	1.00E-03	Moench
MW68	5.9E-04	12.54	3.82	1.5E-04	0.0093	0.23	Moench
MW50 PUMPING TEST							
MW50	7.5E-04	8.8	2.68	2.8E-05	0.84	0.21	Moench
MW68	1.5E-05	8.8	2.68	5.6E-06		0.25	Moench
PW2	1.20E-03	8.8	2.68	4.50E-04	0.0054		Cooper-Jacob
MW58	No Response						
MW67	No Response						
MW54D PUMPING TEST							
MW54D	1.00E-03	10.75	3.28	3.10E-04	4.90E-09		Cooper-Jacob
MW54D	4.40E-04	10.75	3.28	1.30E-04	2.00E-08		Hantush Leaky Confined
MW54D	8.80E-04	10.75	3.28	2.70E-04	2.80E-07		Papadopoulos Cooper Confined
MW54D	5.60E-04	10.75	3.28	1.71E-04	3.10E-05		Theis Confined
GB-03	4.10E-03	10.75	3.28	1.30E-03	3.10E-05		Leaky Hantush Jacob
GB-03	8.90E-06	10.75	3.28	2.70E-06	3.40E-08		Leaky Hantush
GB-03	5.70E-03	10.75	3.28	1.70E-03	3.10E-05		Theis Confined
MW55	No Response						
MW53	No Response						
MW14D	1.10E-04	10.75	3.28	3.40E-05	2.70E-06		Hantush Leaky with Aquitard Storage
MW62 PUMPING TEST							
MW62	9.30E-07	8.62	2.63	3.50E-07	5.60E-05		Moench
PW1	2.60E-06	8.62	2.63	9.90E-07	4.80E-08		Moench
MW61	9.30E-07	8.62	2.63	3.50E-07	5.50E-06		Moench
MW47	4.20E-06	8.62	2.63	1.60E-06	3.00E-08		Moench
PW1 PUMPING TEST							
PW1	2.80E-06	15.23	4.64	6.00E-07	6.20E-01		Cooper-Jacob
MW61	8.00E-05	15.23	4.64	1.70E-05	5.10E-03	1.50E-03	Moench
MW55	9.16E-05	15.23	4.64	2.00E-05	2.05E-02	2.30E-03	Moench
MW56	1.30E-04	15.23	4.64	2.80E-05	0.0082	0.001	Moench
SLUG TESTS							
MW50				8.50E-05			Hvorslev
MW62				7.40E-07			Hvorslev
PW1				3.80E-07			Hvorslev
PW2				4.70E-06			Hvorslev

Aquifer parameters for different tests can vary for the same observation well due to the anisotropic conditions at the site. The aquifer parameters represent the conditions between the pumping well and the

observation wells. Where the same observation well is used in two (2) different tests with different pumping wells, the derived aquifer parameters can be significantly different.

Most of the data were analyzed using the Moench method which utilizes wellbore storage, which refers to the column of water in the well being pumped. At low pumping rates, this water can take significant time to be replaced by water from the aquifer resulting in less observed drawdown in both the pumping and observation wells than if wellbore storage was not occurring.

The deep well, MW54D, showed indications of being in a leaky aquifer with overlying aquitard consistent with the observed stratigraphy. During the course of the test, no drawdown was observed in the nearby shallow observation wells indicating that leakage was likely emanating from aquitard storage. It is possible, that with continued long-term pumping, there could be an effect on the shallow aquifer.

There was no discernable effect on the Sanders Creek water level from any of the pumping tests.

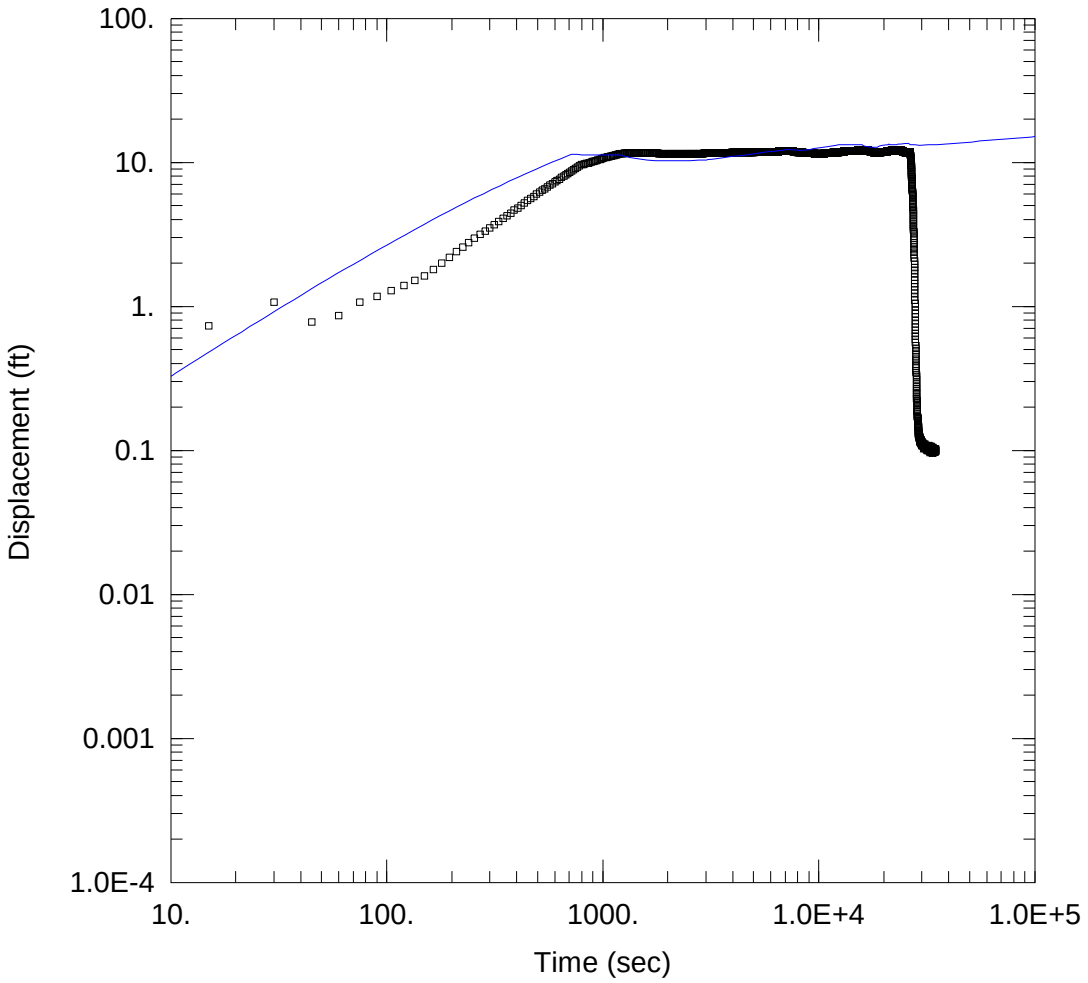
Hydraulic conductivity is the main parameter required for the groundwater model. Therefore, the geometric mean of the hydraulic conductivity was determined for each observation well. These are given in **Table 2**. In this table, where there was only one (1) test result, that result is presented.

Table 2: Geometric Means of Hydraulic Conductivity from Pumping and Slug Tests

OBS WELL	K (m/s)	GEOMEAN K (m/s)
PW2	8.60E-07	1.22E-05
PW2	4.50E-04	
PW2 SLUG	4.70E-06	
MW50	5.50E-05	5.08E-05
MW50	2.80E-05	
MW50 SLUG	8.50E-05	
MW58	2.60E-04	
MW67	1.20E-04	
MW68	1.50E-04	2.90E-05
MW68	5.60E-06	
MW54D	3.10E-04	2.07E-04
MW54D	1.30E-04	
MW54D	2.70E-04	
MW54D	1.70E-04	
GB-03	1.30E-03	1.81E-04
GB-03	2.70E-06	
GB-03	1.70E-03	
MW14D	3.40E-05	
MW62	3.50E-07	5.09E-07
MW62 SLUG	7.40E-07	
PW1	6.00E-07	6.09E-07
PW1	9.90E-07	
PW1 SLUG	3.80E-07	
MW61	3.50E-07	2.44E-06
MW61	1.70E-05	
MW47	1.60E-06	3.12E-06
MW47	6.10E-06[1]	
MW37	2.28E-06[1]	
MW05R	4.88E-05[1]	
MW46	1.53E-06[1]	
MW55	2.00E-05	
MW56	2.80E-05	

Note: 1) Test from previous investigation

Aqtesolv Data Sheets
PW2 Pumping Test



WELL TEST ANALYSIS

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PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW2
Test Date: 5/11/16

AQUIFER DATA

Saturated Thickness: 12.54 ft Anisotropy Ratio (Kz/Kr): 0.1011

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW2	1124806	953445

Observation Wells

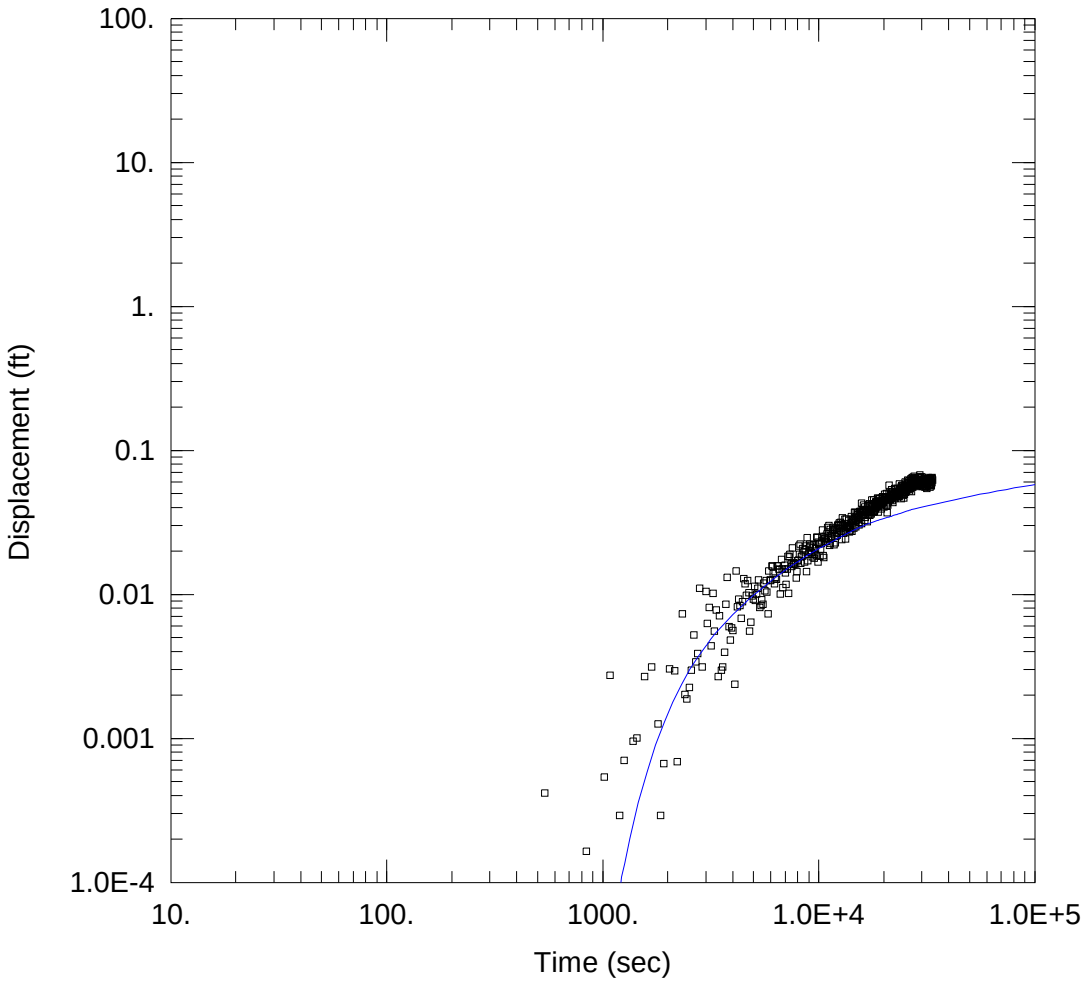
Well Name	X (ft)	Y (ft)
▫ PW2	1124806	953445

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 3.296E-6 m^2/sec
Sy = 0.1738
Sw = 0.
r(c) = 0.167 ft

S = 0.1
Kz/Kr = 0.1011
r(w) = 0.26 ft
alpha = 1.0E+30 sec^{-1}



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PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW2
Test Date: 5/11/16

AQUIFER DATA

Saturated Thickness: 12.54 ft Anisotropy Ratio (Kz/Kr): 0.001

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW2	1124806	953445

Observation Wells

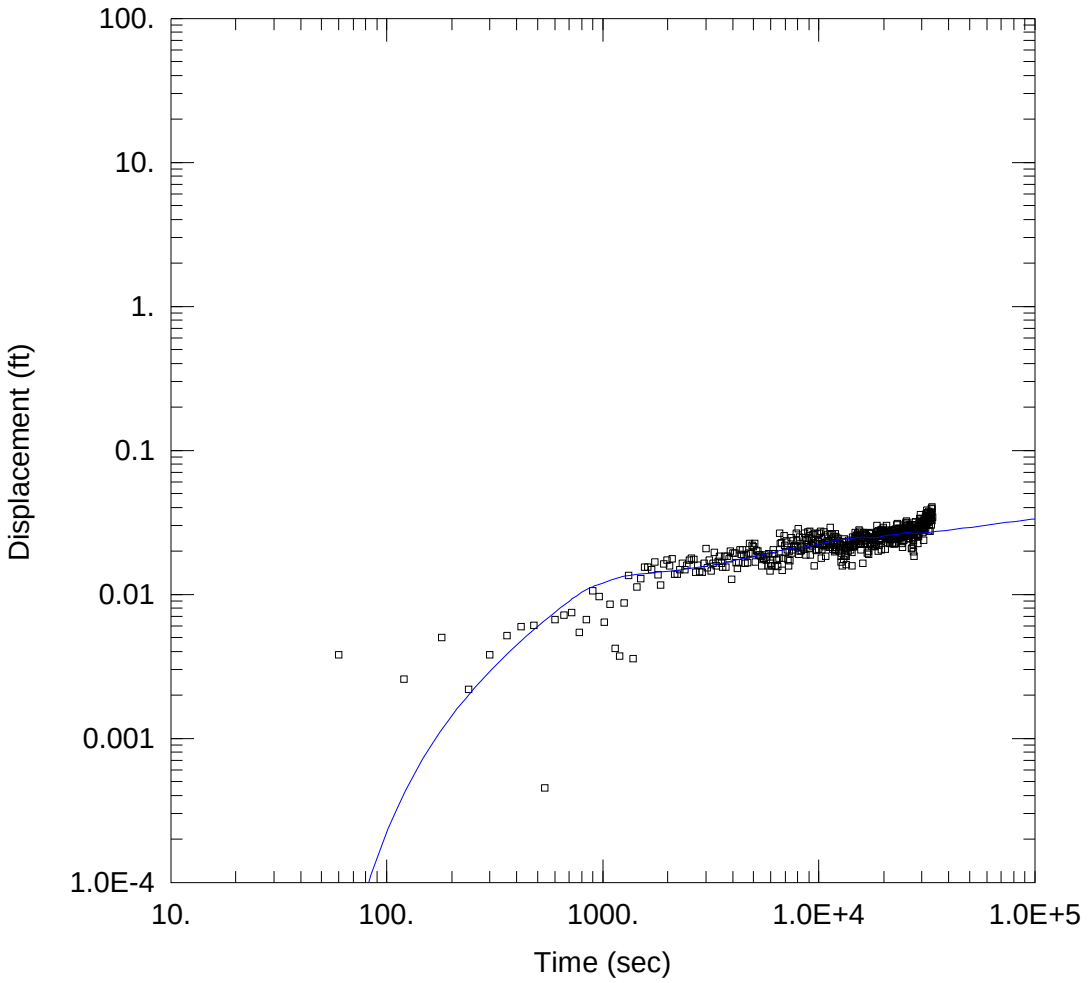
Well Name	X (ft)	Y (ft)
MW50	1124809	953536

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 0.0002129 m^2/sec
Sy = 0.2299
Sw = 0.
r(c) = 0.167 ft

S = 0.00623
Kz/Kr = 0.001
r(w) = 0.26 ft
alpha = 1.0E+30 sec^{-1}



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PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW2
Test Date: 5/11/16

AQUIFER DATA

Saturated Thickness: 12.54 ft Anisotropy Ratio (Kz/Kr): 0.03074

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW2	1124806	953445

Observation Wells

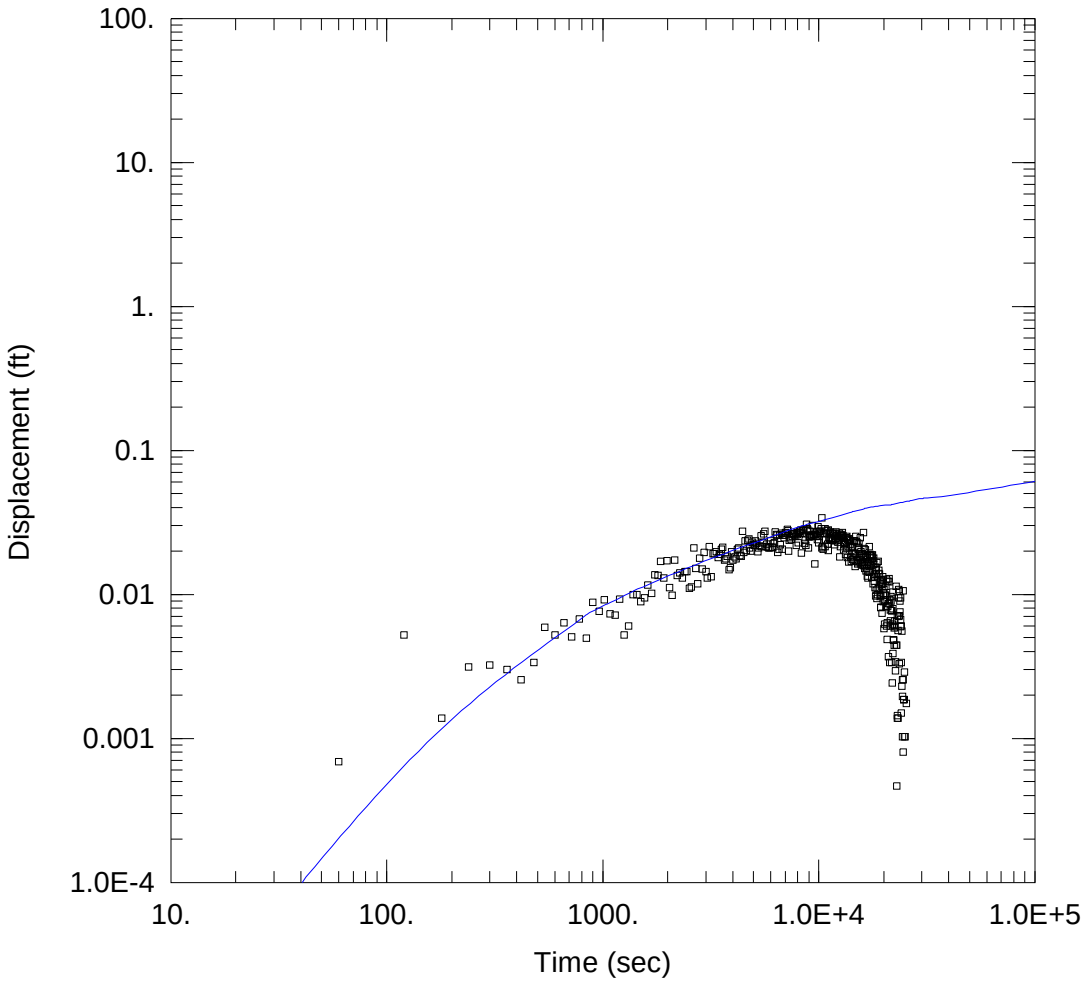
Well Name	X (ft)	Y (ft)
mw58	1124854	953534

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 0.001042 m^2/sec
Sy = 0.001
Sw = 0.
r(c) = 0.167 ft

S = 0.001161
Kz/Kr = 0.03074
r(w) = 0.26 ft
alpha = 1.0E+30 sec^{-1}



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PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW2
Test Date: 5/11/16

AQUIFER DATA

Saturated Thickness: 12.54 ft Anisotropy Ratio (Kz/Kr): 0.4651

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW2	1124806	953445

Observation Wells

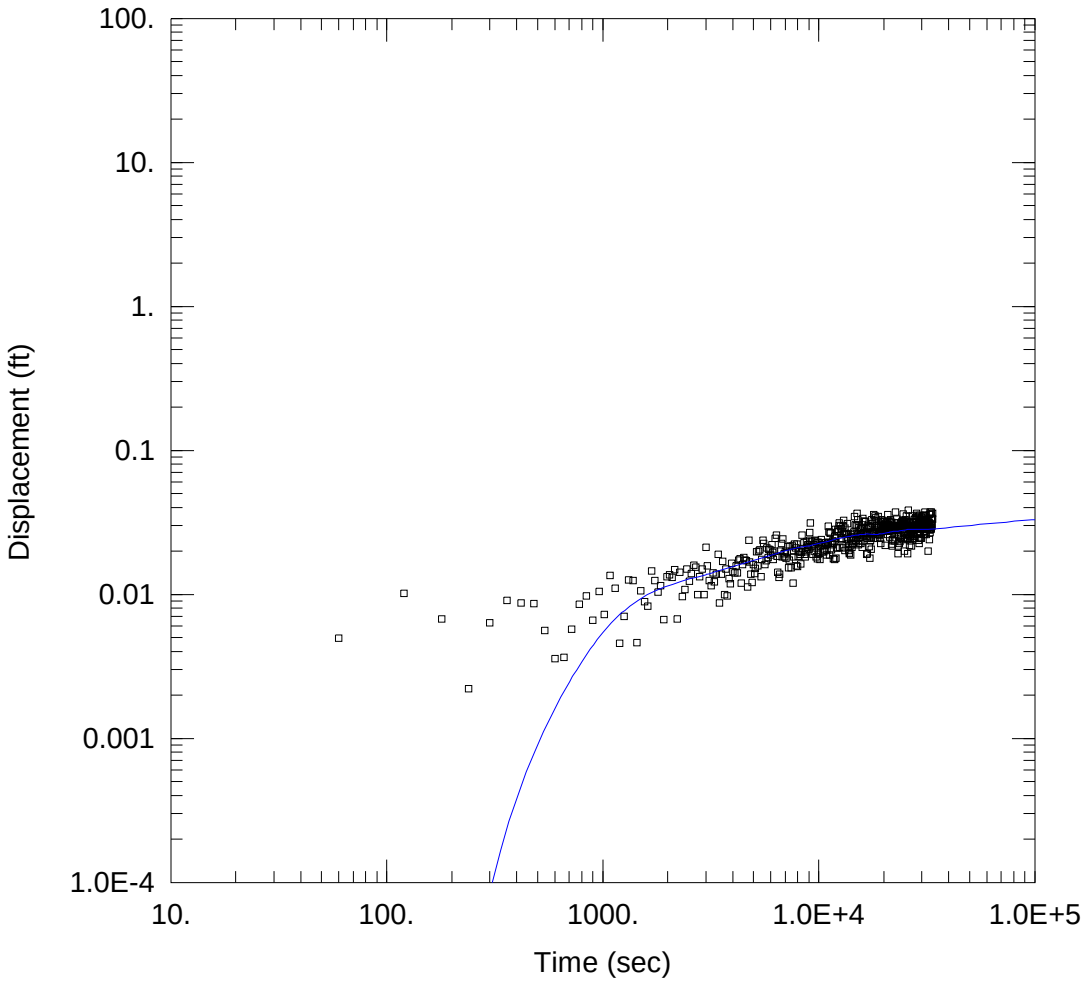
Well Name	X (ft)	Y (ft)
MW67	1124829	953472

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 0.0004424 m^2/sec
Sy = 0.001032
Sw = -8.327E-17
r(c) = 0.167 ft

S = 2.424E-9
Kz/Kr = 0.4651
r(w) = 0.26 ft
alpha = 1.0E+30 sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\pw2\PW2.aqt
Date: 06/15/16 Time: 09:56:33

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW2
Test Date: 5/11/16

AQUIFER DATA

Saturated Thickness: 12.54 ft Anisotropy Ratio (Kz/Kr): 0.001

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW2	1124806	953445

Observation Wells

Well Name	X (ft)	Y (ft)
MW68	1124855	953476.3

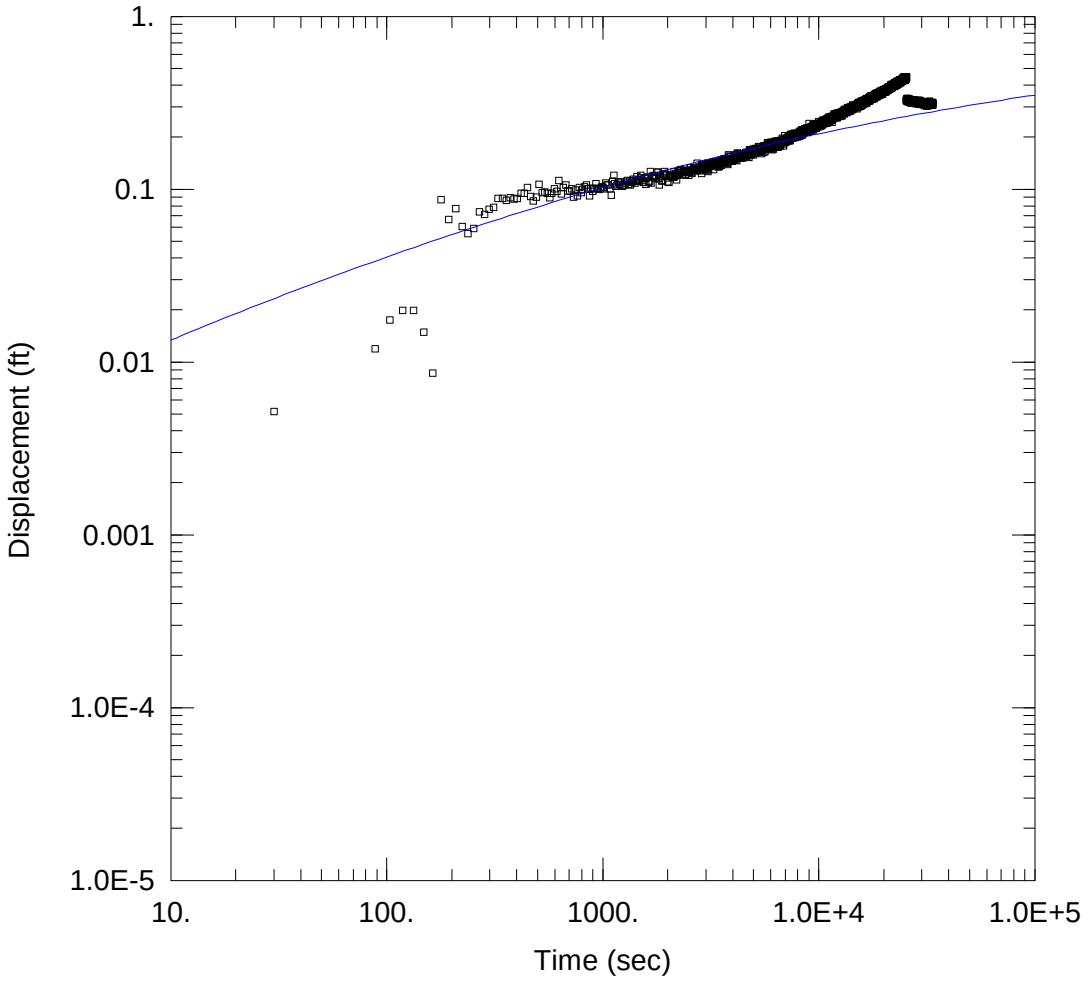
SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 0.0005925 m^2/sec
Sy = 0.2299
Sw = 0.
r(c) = 0.167 ft

S = 0.009275
Kz/Kr = 0.001
r(w) = 0.26 ft
alpha = 1.0E+30 sec^{-1}

Aqtesolv Data Sheets
MW50 Pumping Test



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW50 TEST\MW50.aqt
Date: 06/28/16 Time: 16:48:14

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW50
Test Date: 5/12/16

AQUIFER DATA

Saturated Thickness: 8.8 ft Anisotropy Ratio (Kz/Kr): 0.1315

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW50	1124809	953536

Observation Wells

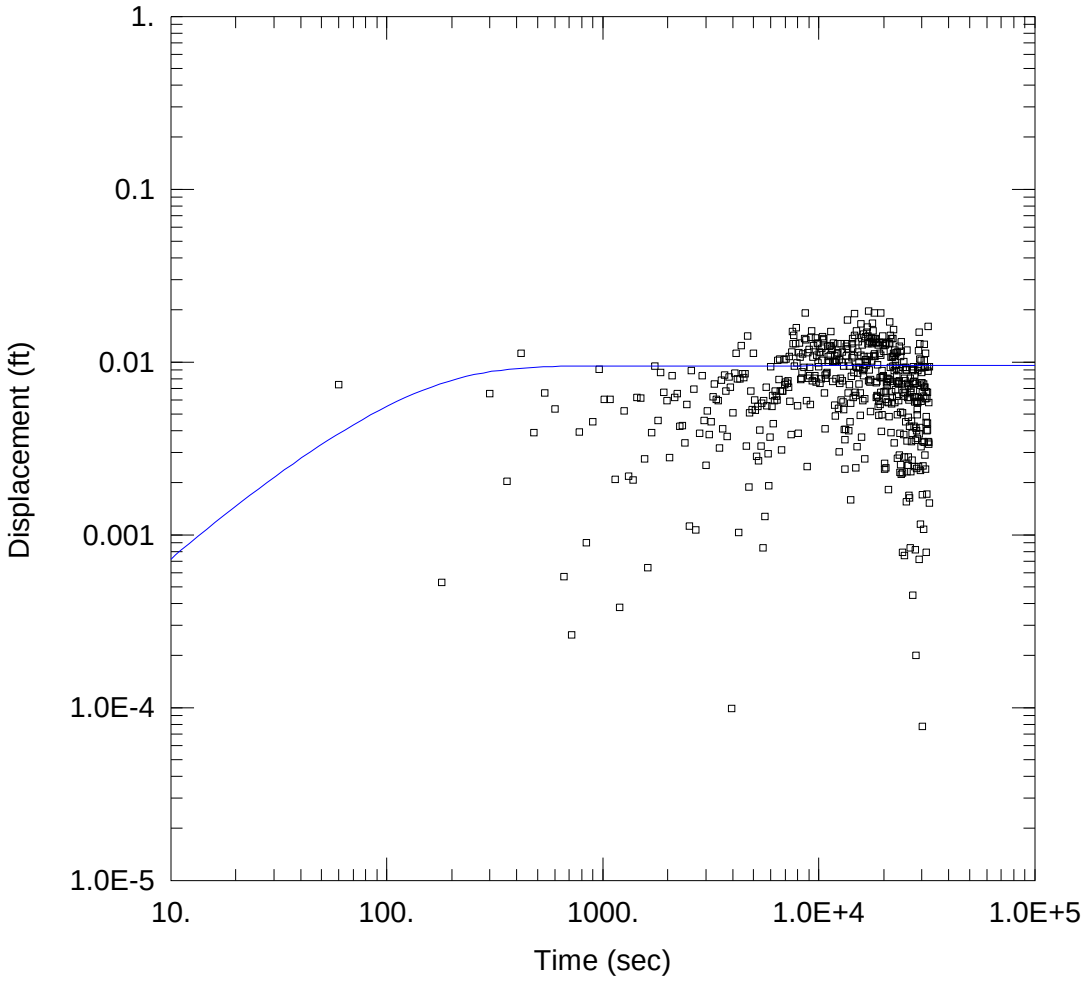
Well Name	X (ft)	Y (ft)
MW50	1124809	953536

SOLUTION

Aquifer Model: Unconfined
Solution Method: Moench

T = 0.0007482 m^2/sec
Sy = 0.2161
Sw = -2.45
r(c) = 0.083 ft

S = 0.8424
Kz/Kr = 0.1315
r(w) = 0.2754 ft
alpha = 1.092E+4 sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW50 TEST\MW50.aqt
Date: 06/21/16 Time: 11:06:53

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW50
Test Date: 5/12/16

AQUIFER DATA

Saturated Thickness: 8.8 ft Anisotropy Ratio (Kz/Kr): 0.09976

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW50	1124809	953536

Observation Wells

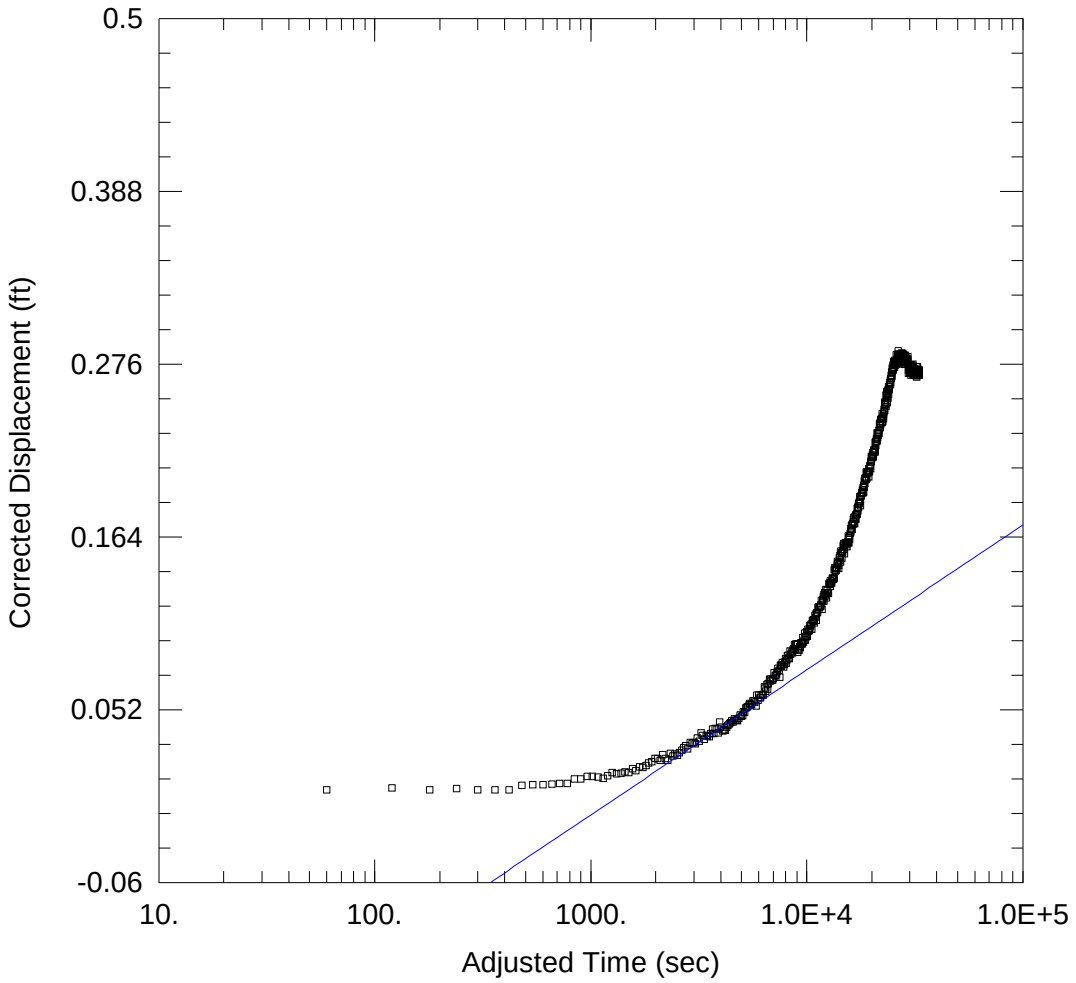
Well Name	X (ft)	Y (ft)
MW68	1124855	953476.3

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 1.504E-5 m^2/sec
Sy = 0.2524
Sw = -4.95
r(c) = 0.083 ft

S = 8424.5
Kz/Kr = 0.09976
r(w) = 0.2754 ft
alpha = 1.0E+30 sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW50 TEST\MW50.aqt
Date: 06/21/16 Time: 13:05:43

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW50
Test Date: 5/12/16

AQUIFER DATA

Saturated Thickness: 8.8 ft Anisotropy Ratio (Kz/Kr): 0.08108

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW50	1124809	953536

Observation Wells

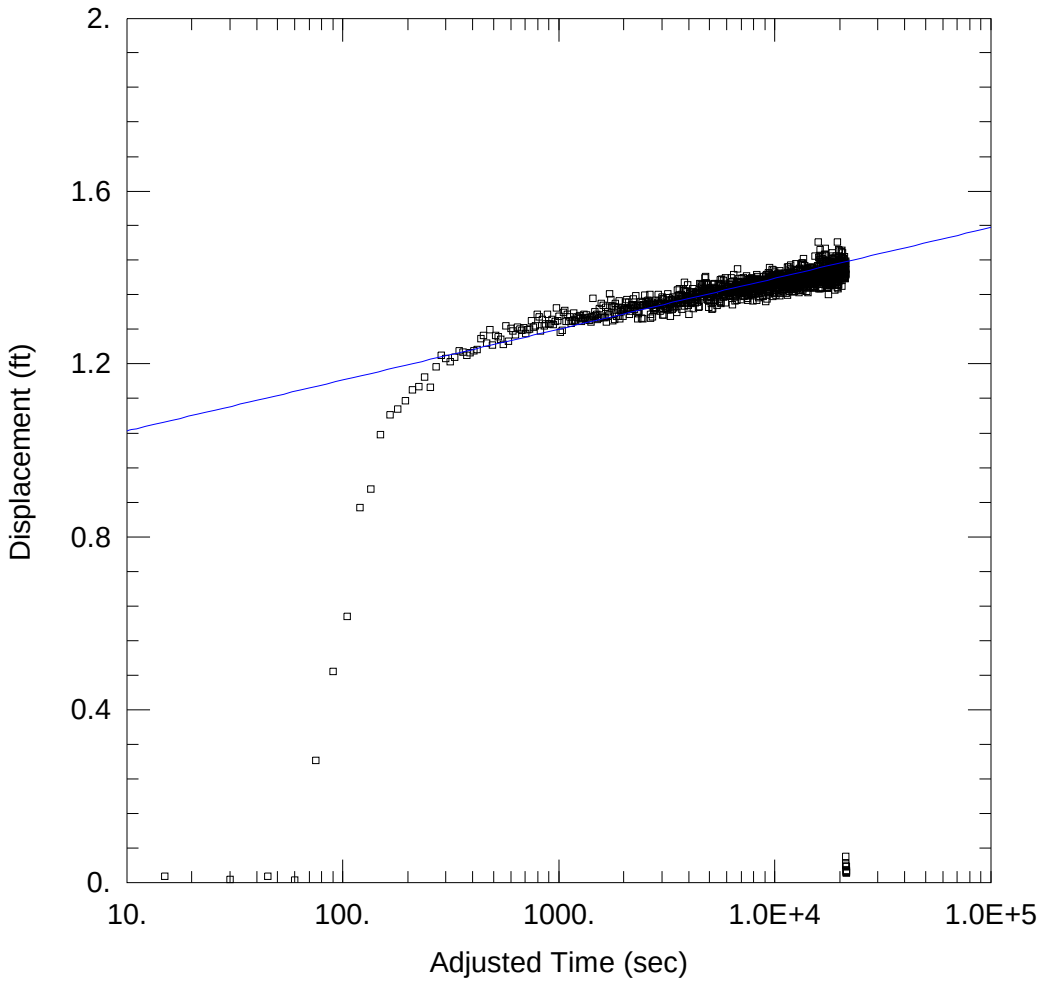
Well Name	X (ft)	Y (ft)
PW2	1124806	953445

SOLUTION

Aquifer Model: Unconfined Solution Method: Cooper-Jacob

T = 0.001243 m^2/sec S = 0.005414

Aqtesolv Data Sheets
MW54D Pumping Test



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/15/16 Time: 15:17:00

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

AQUIFER DATA

Saturated Thickness: 10.75 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

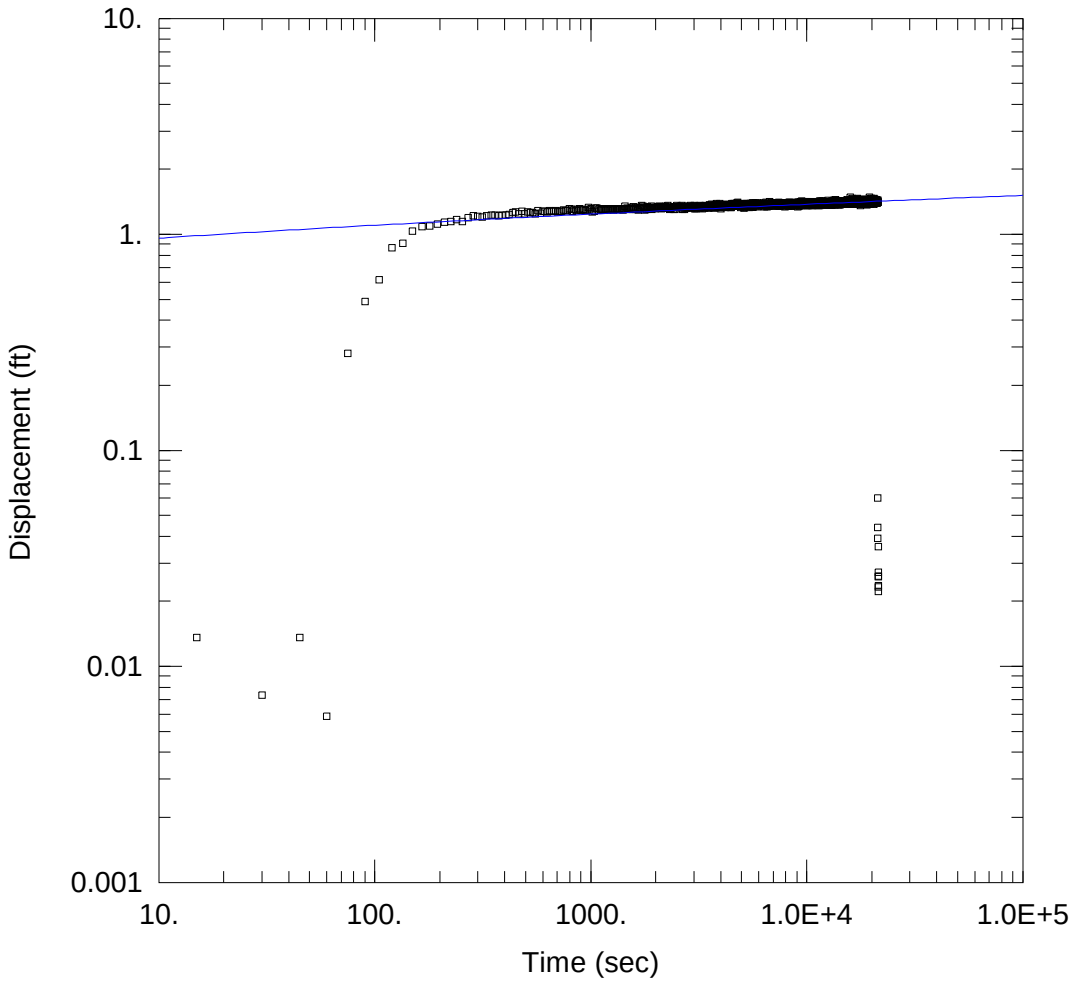
Observation Wells

Well Name	X (ft)	Y (ft)
▫ MW54D	1124845	953721.7

SOLUTION

Aquifer Model: Confined Solution Method: Cooper-Jacob

T = 0.001028 m^2/sec S = 4.874E-9



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/15/16 Time: 15:10:51

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

AQUIFER DATA

Saturated Thickness: 10.75 ft
Aquitard Thickness (b'): 1. ft
Anisotropy Ratio (Kz/Kr): 0.1
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

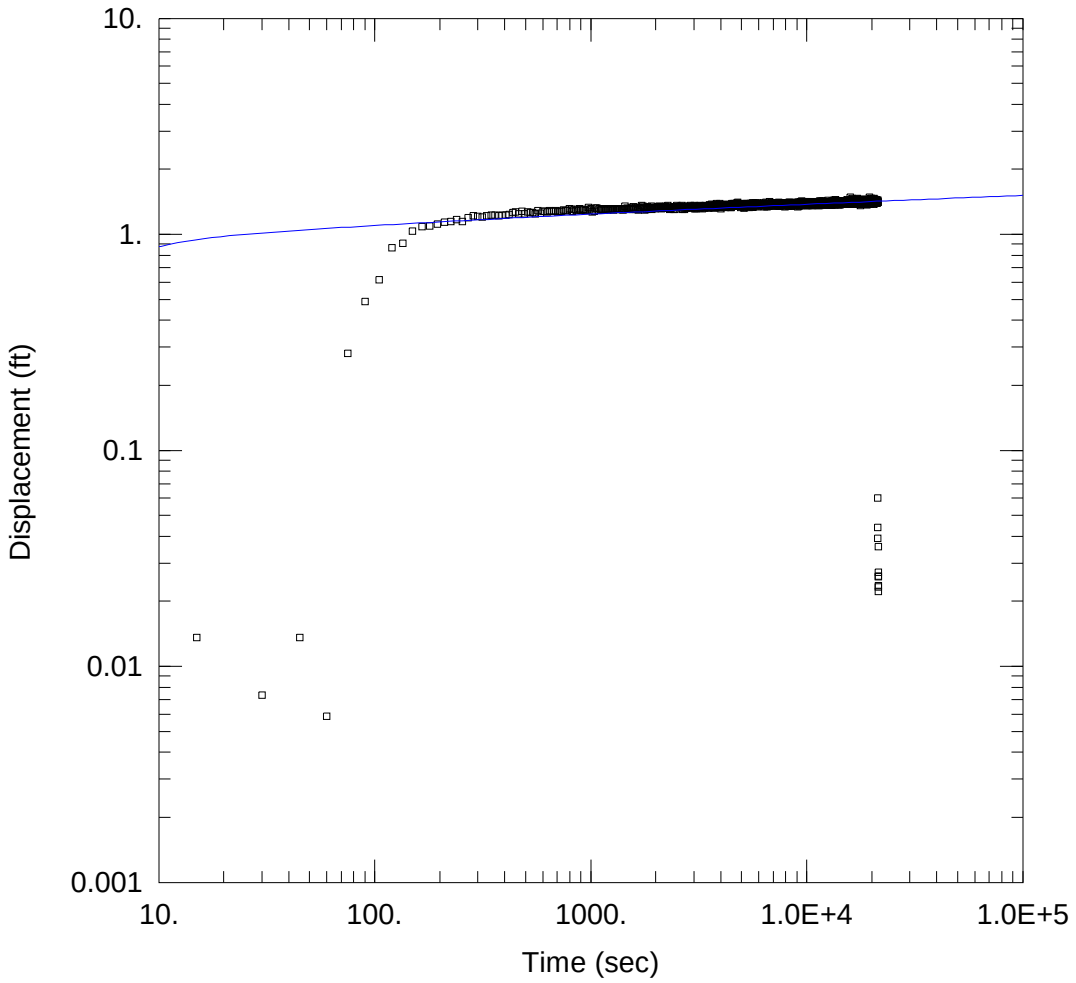
Observation Wells

Well Name	X (ft)	Y (ft)
▫ MW54D	1124845	953721.7

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

T = 0.00044 m^2/sec
r/B' = 1.0E-5
r/B" = 0.
S = 2.037E-8
ß' = 0.7671
ß" = 0.



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/15/16 Time: 15:13:03

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

AQUIFER DATA

Saturated Thickness: 10.75 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

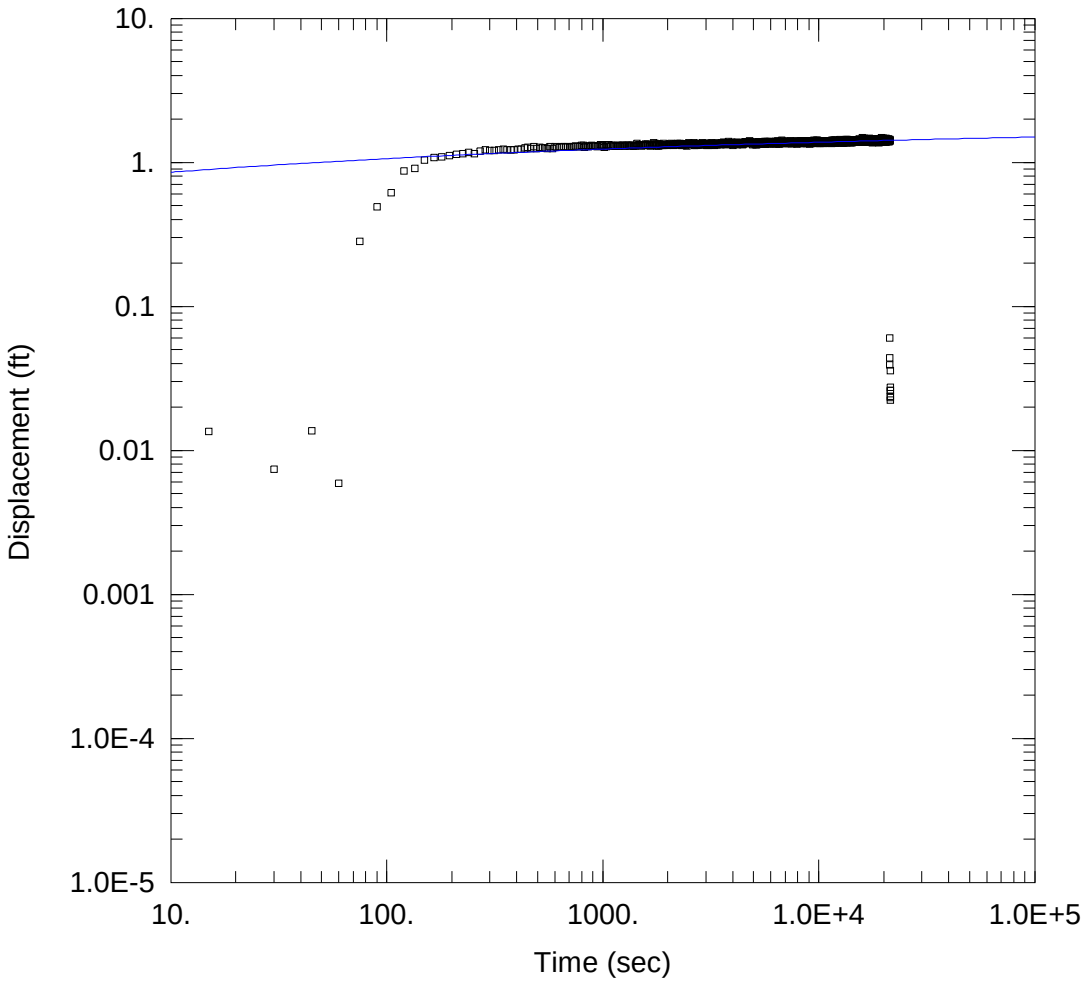
Observation Wells

Well Name	X (ft)	Y (ft)
▫ MW54D	1124845	953721.7

SOLUTION

Aquifer Model: Confined
Solution Method: Papadopulos-Cooper

T = 0.0008836 m^2/sec
S = 2.768E-7
r(w) = 0.26 ft
r(c) = 0.083 ft



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/28/16 Time: 16:17:31

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

AQUIFER DATA

Saturated Thickness: 10.75 ft
Aquitard Thickness (b'): 19.3 ft
Anisotropy Ratio (Kz/Kr): 0.1059
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

Observation Wells

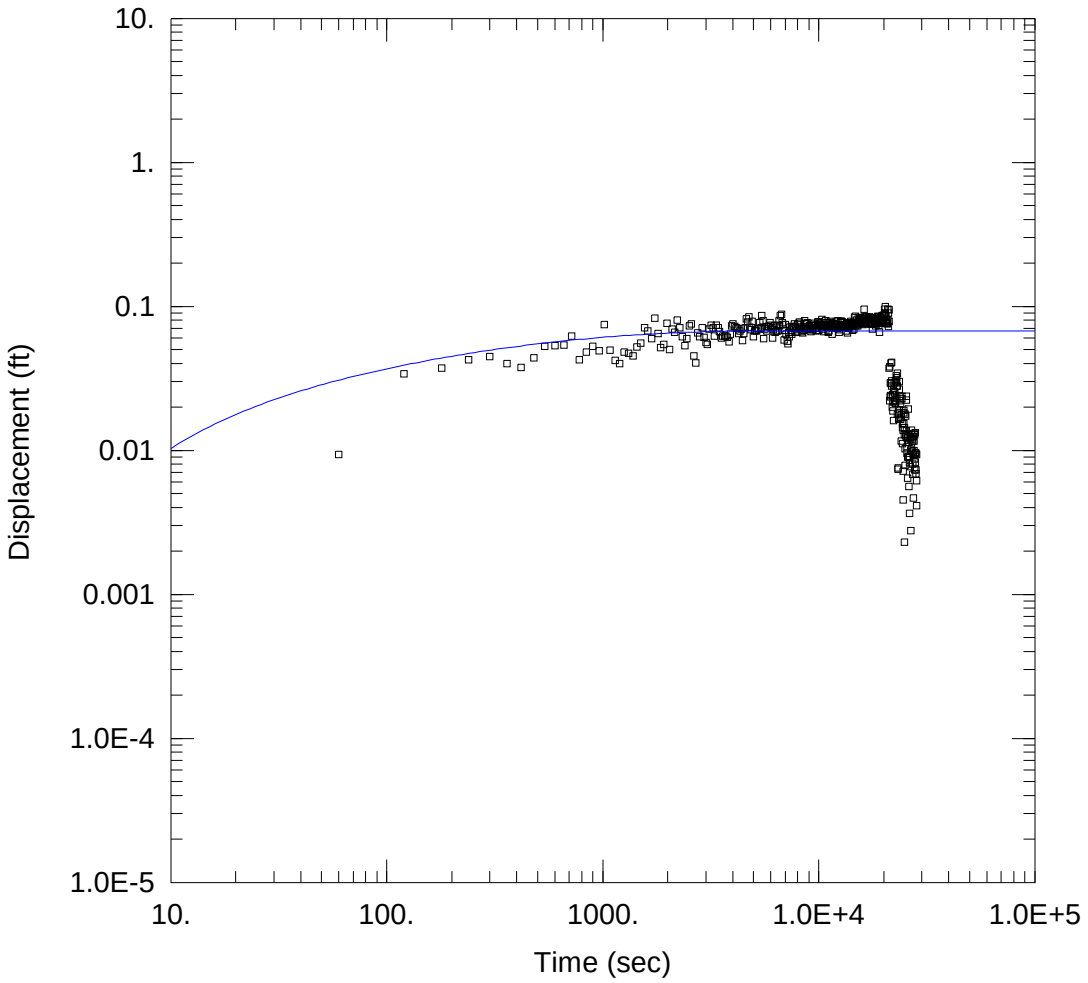
Well Name	X (ft)	Y (ft)
▫ MW54D	1124845	953721.7

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

T = 0.0005603 m^2/sec
1/B' = 1.567E-5 ft^{-1}
1/B" = 0. ft^{-1}

S = 3.075E-5
ß'/r = 0.0004861 ft^{-1}
ß"/r = 0. ft^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/15/16 Time: 15:58:23

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

Observation Wells

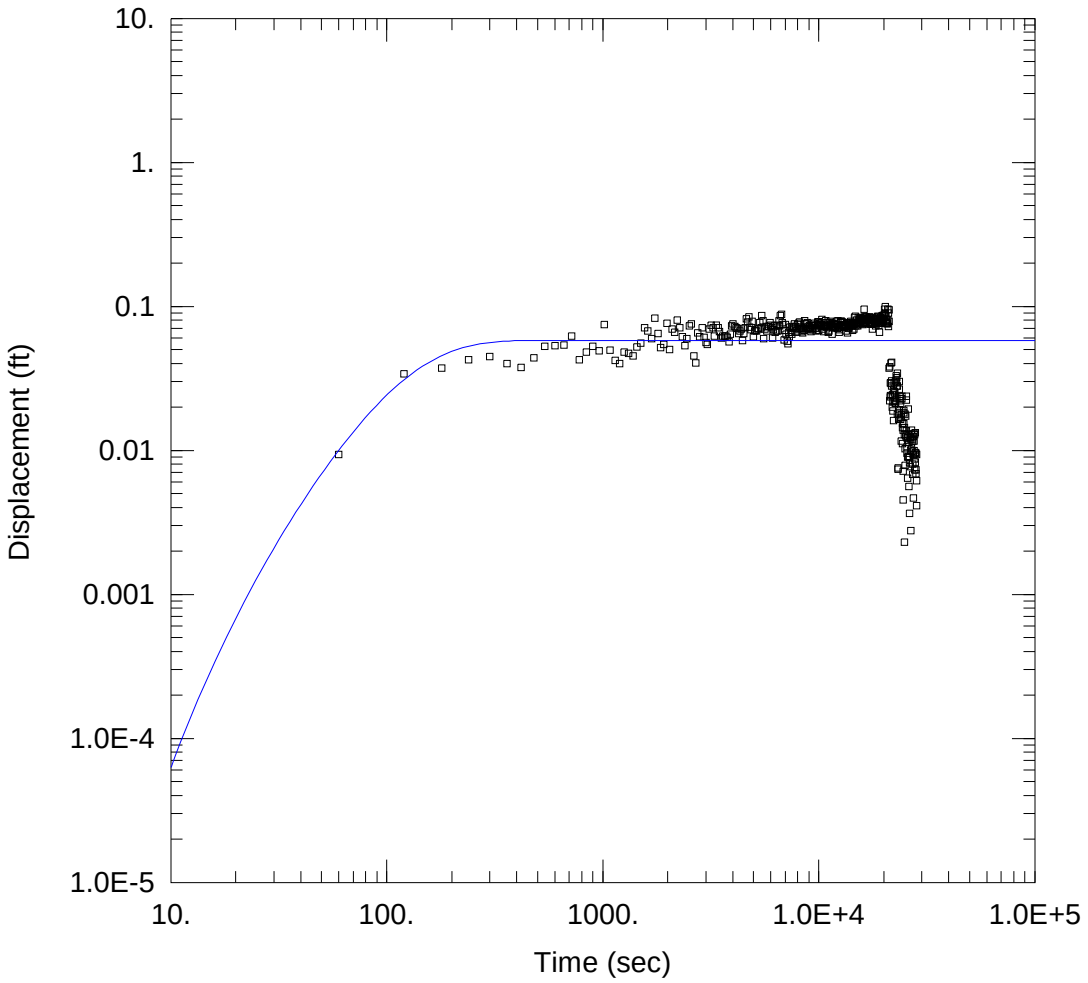
Well Name	X (ft)	Y (ft)
GB-03	1124840	953588

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush-Jacob

T = 0.00409 m^2/sec
1/B = 0.0006041 ft^{-1}
b = 10.75 ft

S = 3.075E-5
Kz/Kr = 0.1023



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/15/16 Time: 16:03:46

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

AQUIFER DATA

Saturated Thickness: 10.75 ft
Aquitard Thickness (b'): 1. ft
Anisotropy Ratio (Kz/Kr): 0.1023
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

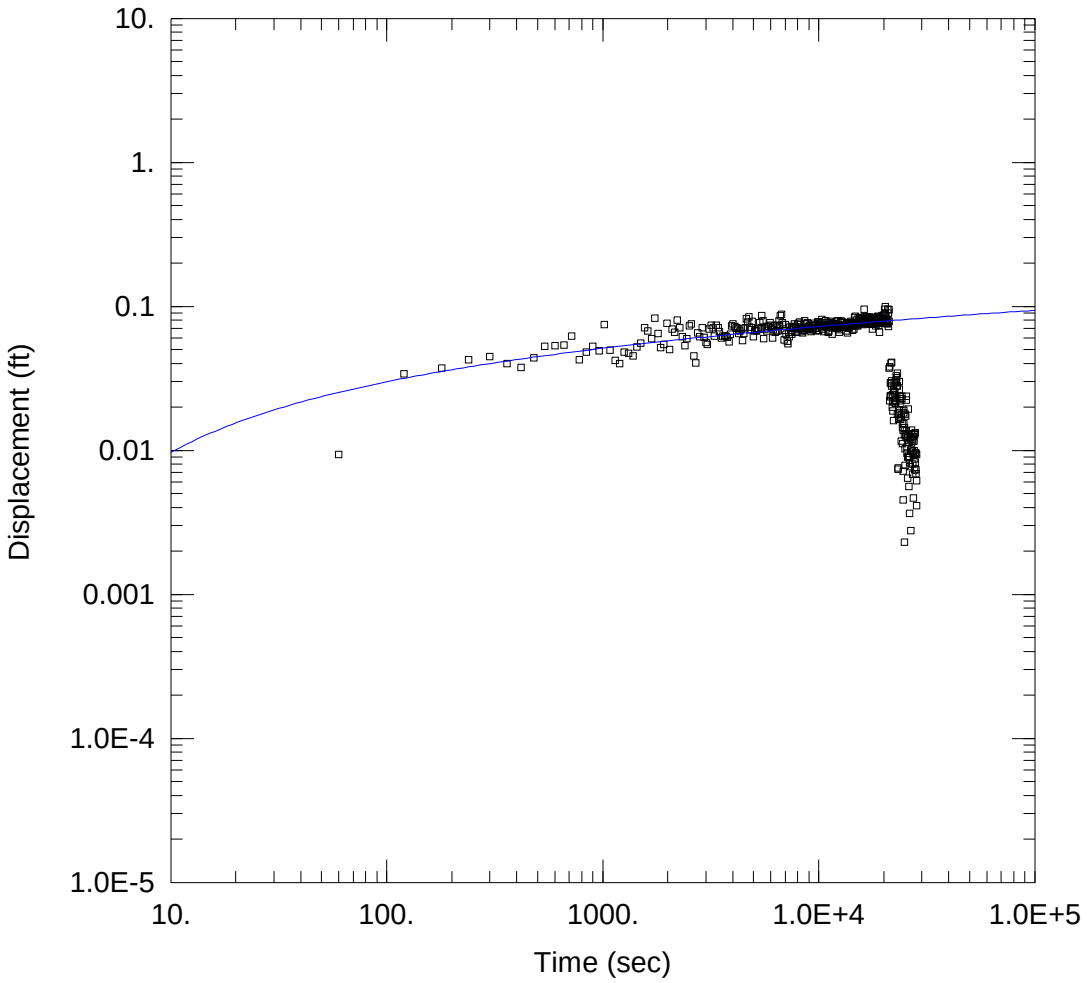
Observation Wells

Well Name	X (ft)	Y (ft)
GB-03	1124840	953588

SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

T = 8.911E-6 m^2/sec
1/B' = 0.03542 ft^{-1}
1/B" = 0. ft^{-1}
S = 3.447E-8
ß'/r = 0.2007 ft^{-1}
ß"/r = 0. ft^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/28/16 Time: 15:27:57

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

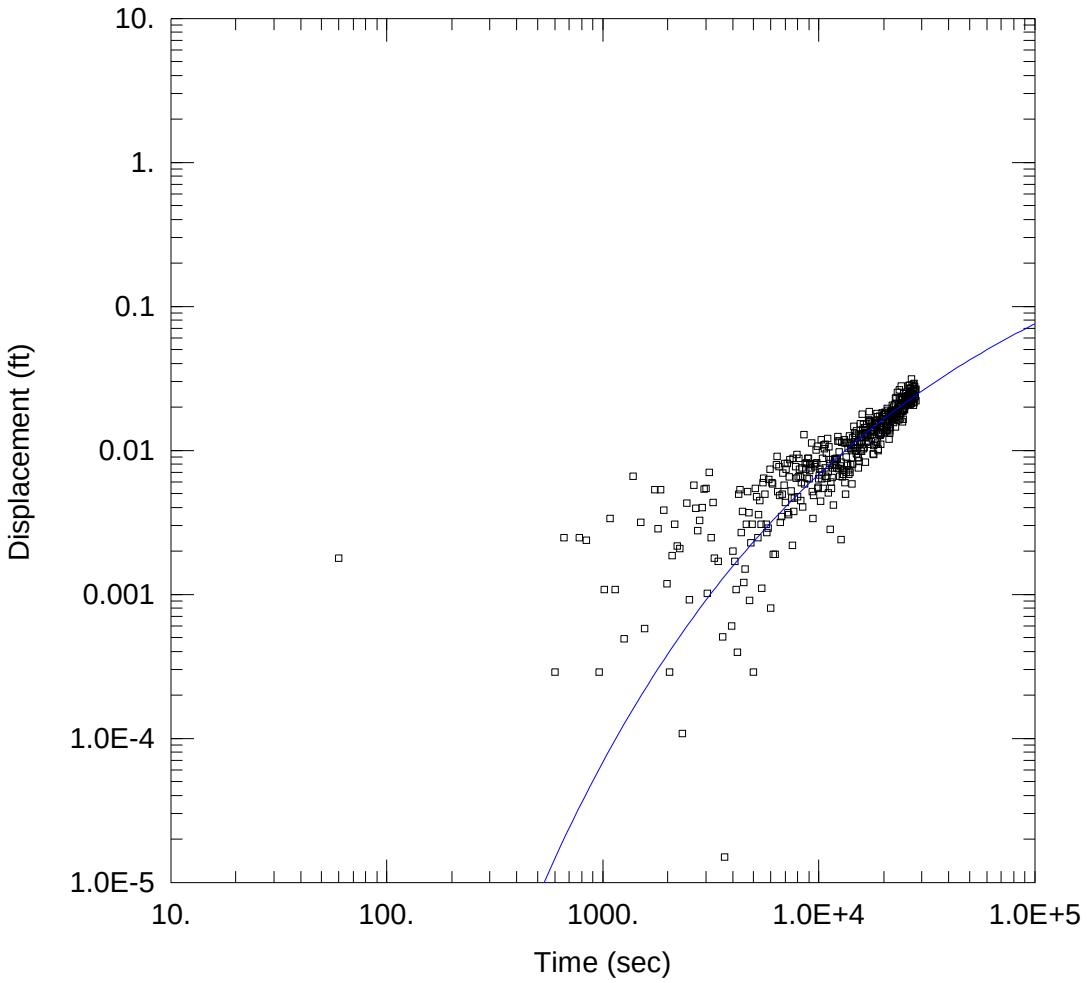
Observation Wells

Well Name	X (ft)	Y (ft)
▫ GB-03	1124840	953588

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.005675 m^2/sec
S = 3.075E-5
Kz/Kr = 0.1023
b = 10.75 ft



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW54D\MW54D.aqt
Date: 06/28/16 Time: 15:58:16

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW54D
Test Date: 5/17/16

AQUIFER DATA

Saturated Thickness: 10.75 ft
Aquitard Thickness (b'): 19.3 ft
Anisotropy Ratio (Kz/Kr): 0.1059
Aquitard Thickness (b"): 1. ft

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW54D	1124845	953721.7

Observation Wells

Well Name	X (ft)	Y (ft)
▫ MW14D	1124855	953333.4

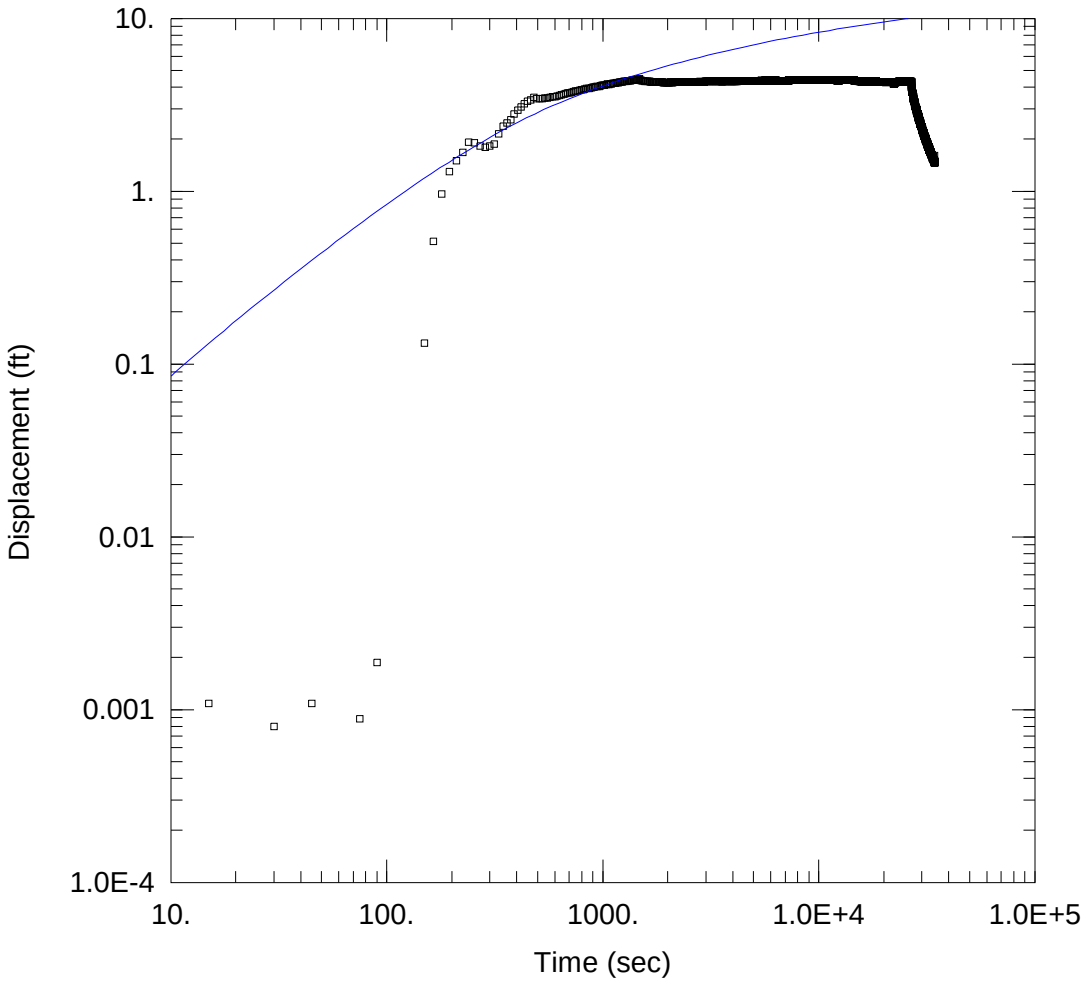
SOLUTION

Aquifer Model: Leaky
Solution Method: Hantush

T = 0.0001061 m^2/sec
1/B' = 1.567E-5 ft^{-1}
1/B" = 0. ft^{-1}

S = 2.723E-6
ß'/r = 0.06487 ft^{-1}
ß"/r = 0. ft^{-1}

Aqtesolv Data Sheets
MW62 Pumping Test



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW62\MW62.aqt
Date: 06/15/16 Time: 12:26:07

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW62
Test Date: 5/13/16

AQUIFER DATA

Saturated Thickness: 8.62 ft Anisotropy Ratio (Kz/Kr): 67.77

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW62	1124763	953669.3

Observation Wells

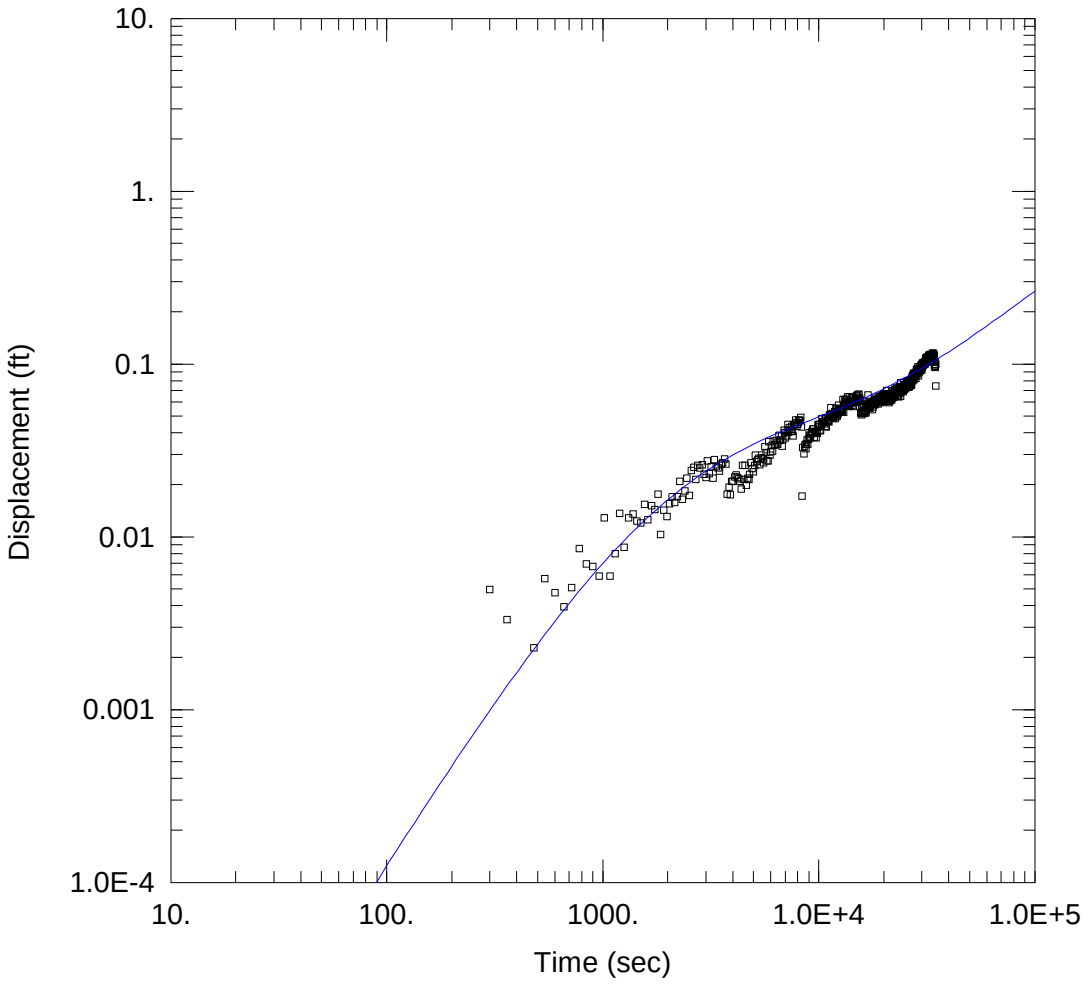
Well Name	X (ft)	Y (ft)
▫ MW62	1124763	953669.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Moench

T = 9.29E-7 m^2/sec
Sy = 0.01868
Sw = 0.
r(c) = 0.083 ft

S = 5.569E-5
ß = 0.06166
r(w) = 0.26 ft
alpha = 1.0E+30 sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW62\MW62.aqt
Date: 06/15/16 Time: 12:50:34

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW62
Test Date: 5/13/16

AQUIFER DATA

Saturated Thickness: 8.62 ft Anisotropy Ratio (Kz/Kr): 0.08148

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW62	1124763	953669.3

Observation Wells

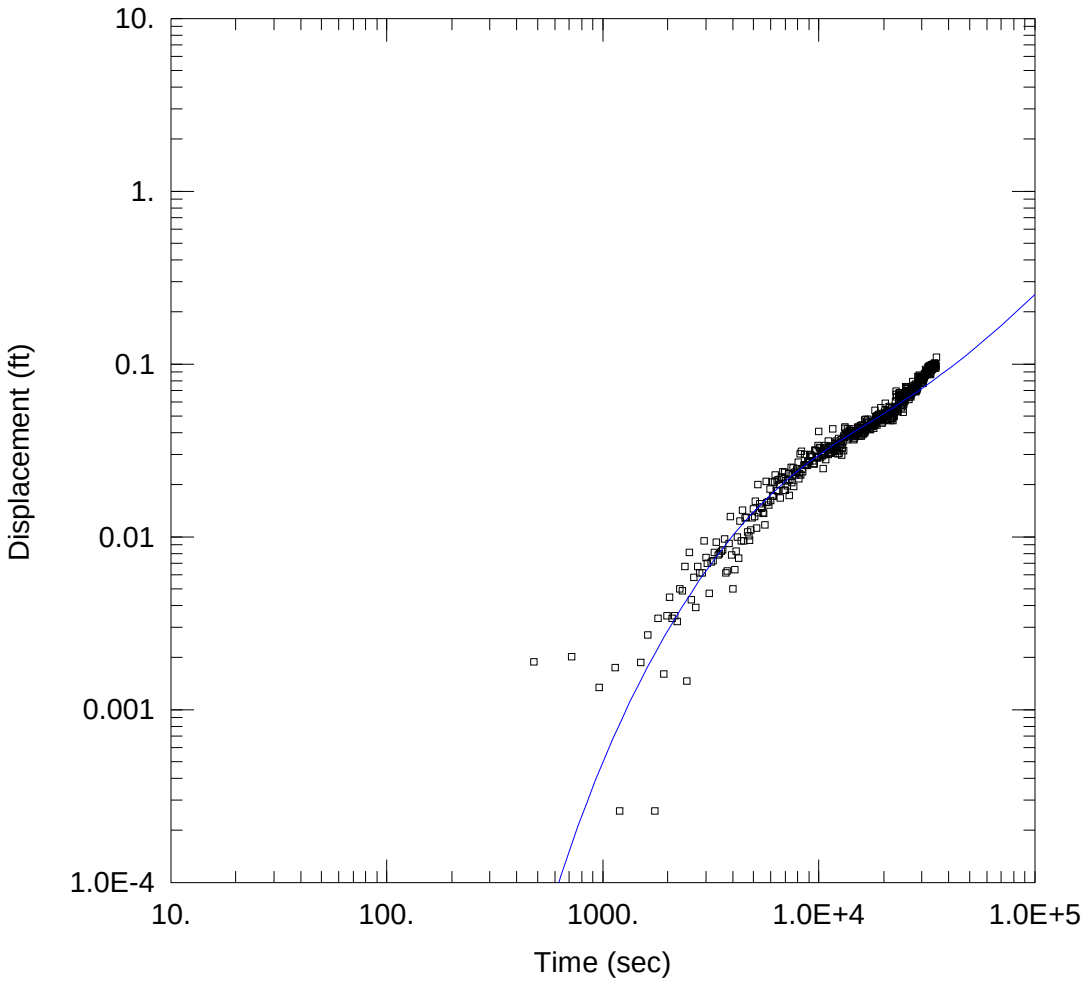
Well Name	X (ft)	Y (ft)
PW1	1124816	953687.2

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 2.618E-6 m^2/sec
Sy = 0.00254
Sw = 0.
r(c) = 0.083 ft

S = 4.748E-8
Kz/Kr = 0.08148
r(w) = 0.26 ft
alpha = 1.0E+30 sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW62\MW62.aqt
Date: 06/15/16 Time: 13:04:04

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW62
Test Date: 5/13/16

AQUIFER DATA

Saturated Thickness: 8.62 ft Anisotropy Ratio (Kz/Kr): 0.08094

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW62	1124763	953669.3

Observation Wells

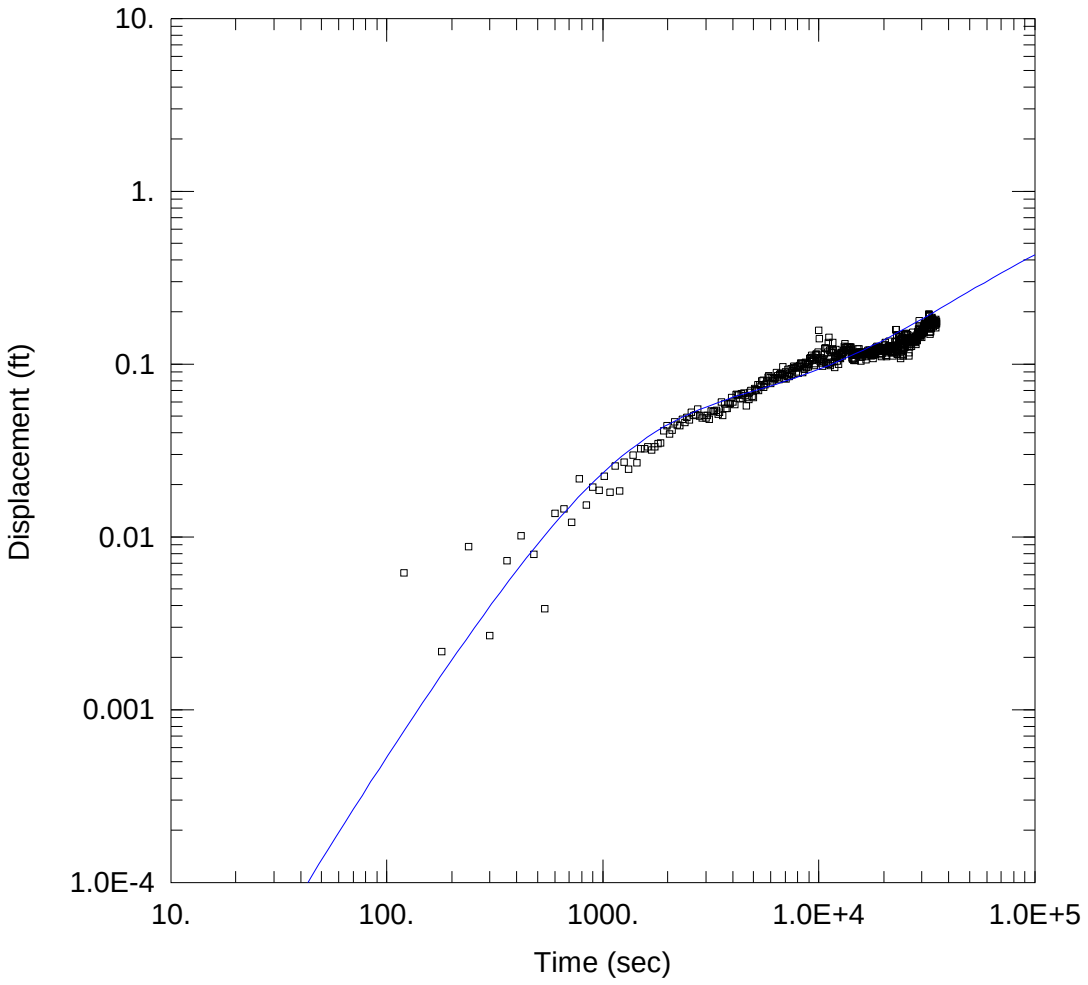
Well Name	X (ft)	Y (ft)
MW61	1124821	953720

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 9.29E-7 m^2/sec
Sy = 0.001106
Sw = 10.
r(c) = 0.083 ft

S = 5.52E-6
Kz/Kr = 0.08094
r(w) = 0.2426 ft
alpha = 10. sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\MW62\MW62.aqt
Date: 06/15/16 Time: 13:14:04

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW62
Test Date: 5/13/16

AQUIFER DATA

Saturated Thickness: 8.62 ft Anisotropy Ratio (Kz/Kr): 0.03533

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
MW62	1124763	953669.3

Observation Wells

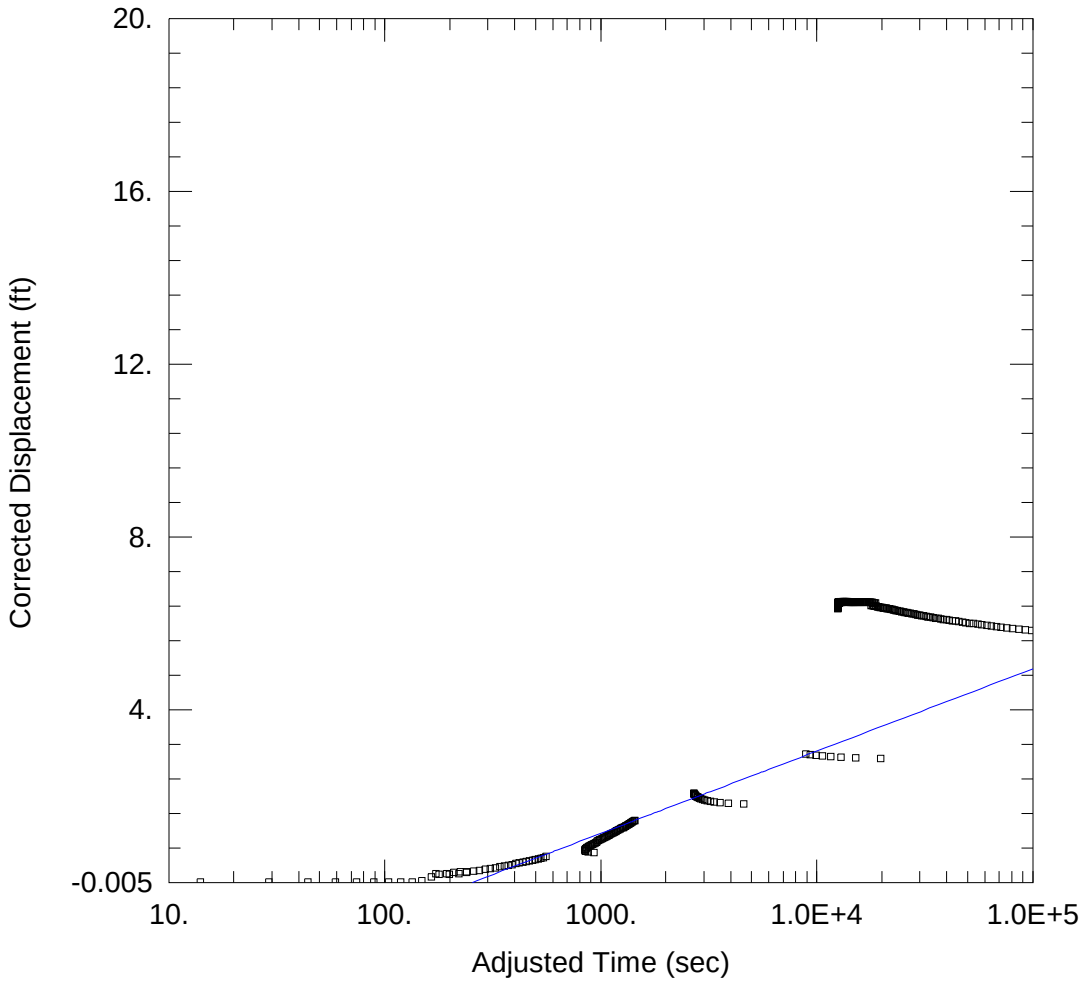
Well Name	X (ft)	Y (ft)
MW47	1124759	953732.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Moench

T = 4.15E-6 m^2/sec
Sy = 0.001
Sw = 10.
r(c) = 0.083 ft
S = 3.02E-8
Kz/Kr = 0.03533
r(w) = 0.2426 ft
alpha = 10. sec^{-1}

Aqtesolv Data Sheets
PW1 Pumping Test



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\pw1\PW1.aqt
Date: 07/07/16 Time: 09:39:45

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW1
Test Date: 5/16/16

AQUIFER DATA

Saturated Thickness: 15.23 ft Anisotropy Ratio (Kz/Kr): 0.08347

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW1	953687.2	1124816

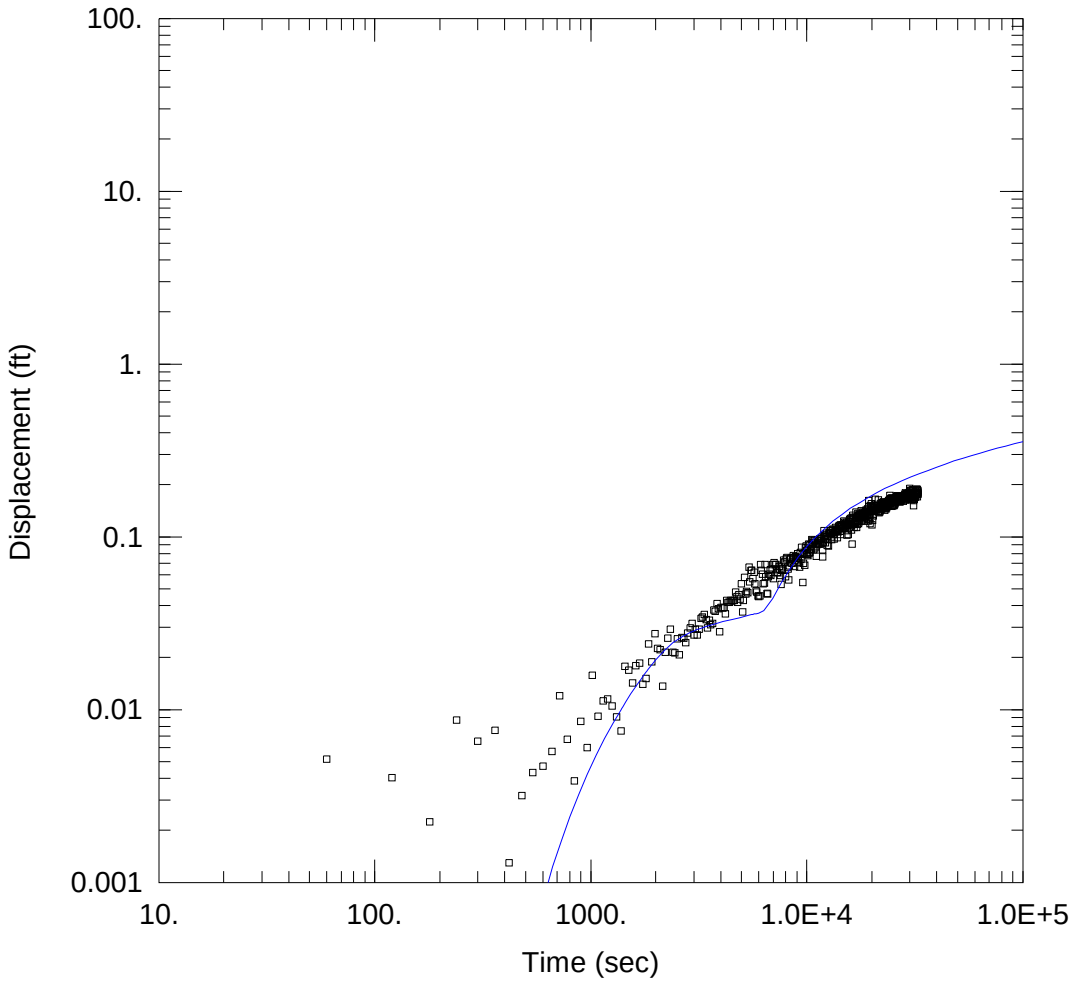
Observation Wells

Well Name	X (ft)	Y (ft)
▫ PW1	953687.2	1124816

SOLUTION

Aquifer Model: Unconfined Solution Method: Cooper-Jacob

T = 2.767E-6 m^2/sec S = 0.6166



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\pw1\PW1.aqt
Date: 07/07/16 Time: 10:20:04

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW1
Test Date: 5/16/16

AQUIFER DATA

Saturated Thickness: 15.23 ft Anisotropy Ratio (Kz/Kr): 0.2596

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW1	953687.2	1124816

Observation Wells

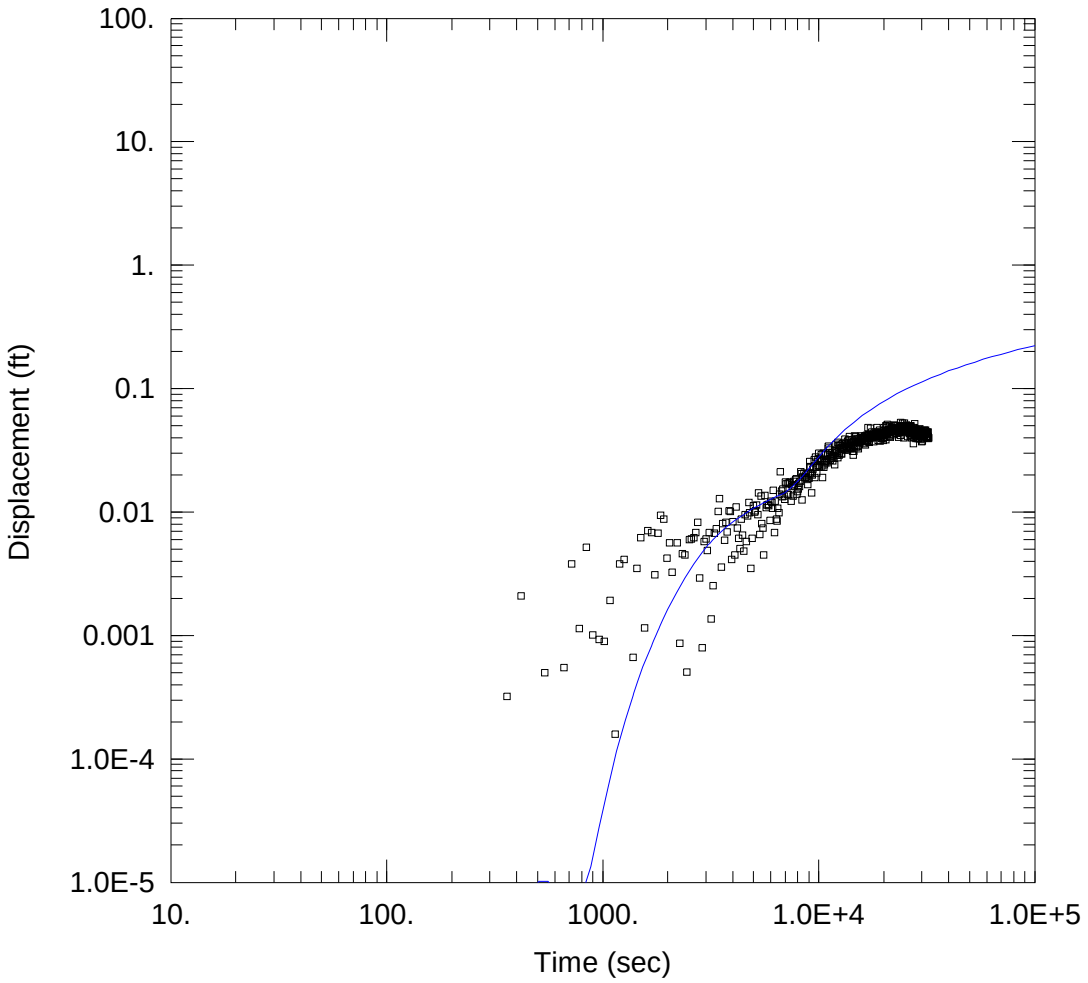
Well Name	X (ft)	Y (ft)
MW61	953720	1124821

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 7.978E-5 m^2/sec
Sy = 0.0015
Sw = -0.825
r(c) = 0.1667 ft

S = 0.005149
Kz/Kr = 0.2596
r(w) = 0.1667 ft
alpha = 1.0E+30 sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\pw1\PW1.aqt
Date: 07/07/16 Time: 10:48:18

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW1
Test Date: 5/16/16

AQUIFER DATA

Saturated Thickness: 15.23 ft Anisotropy Ratio (Kz/Kr): 0.2596

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW1	953687.2	1124816

Observation Wells

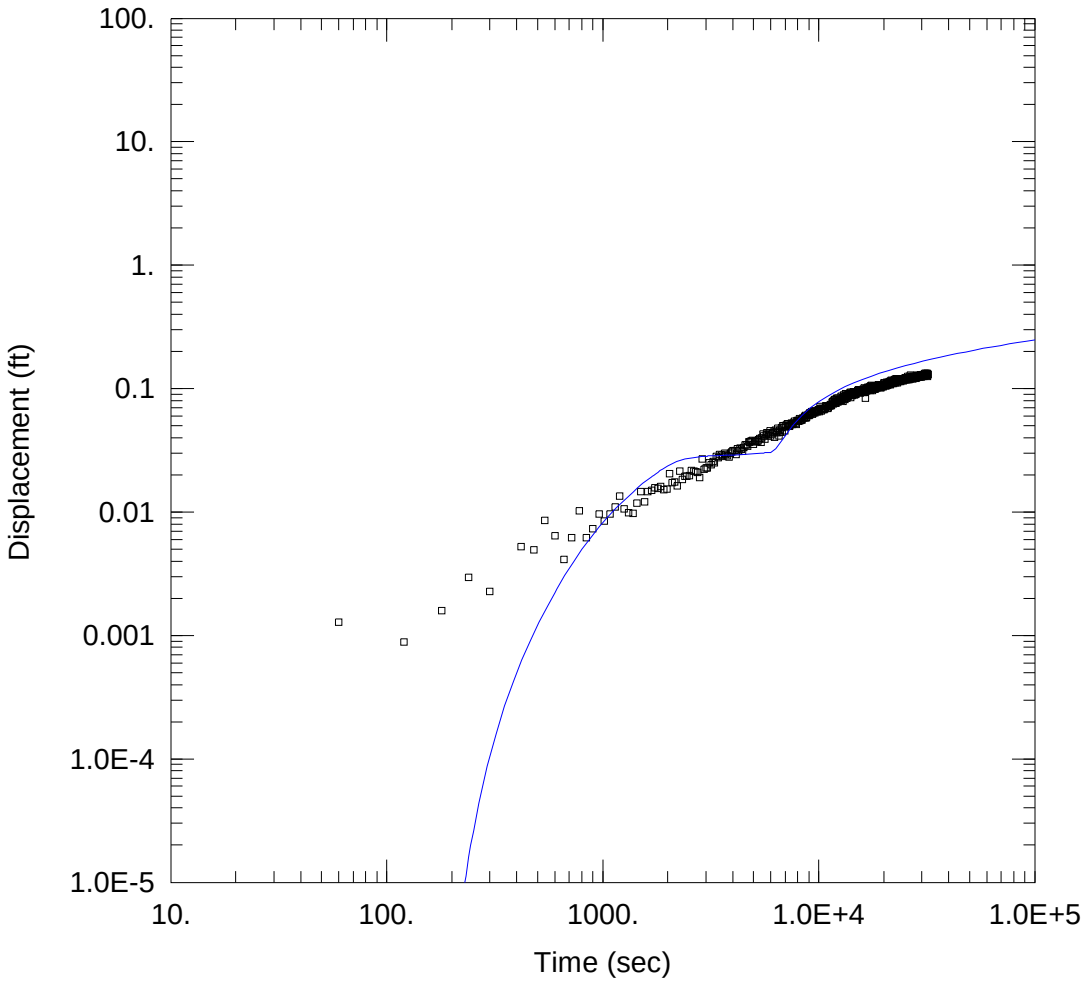
Well Name	X (ft)	Y (ft)
MW55	953702	1124843

SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 9.16E-5 m^2/sec
Sy = 0.002318
Sw = -0.825
r(c) = 0.1667 ft

S = 0.0205
Kz/Kr = 0.2596
r(w) = 0.1667 ft
alpha = 1.0E+30 sec^{-1}



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed pump tests\pw1\PW1 MOENCH.aqt
Date: 07/07/16 Time: 11:14:40

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW1
Test Date: 5/16/16

AQUIFER DATA

Saturated Thickness: 15.23 ft Anisotropy Ratio (Kz/Kr): 0.2596

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
PW1	953687.2	1124816

Observation Wells

Well Name	X (ft)	Y (ft)
MW56	953677	1124842

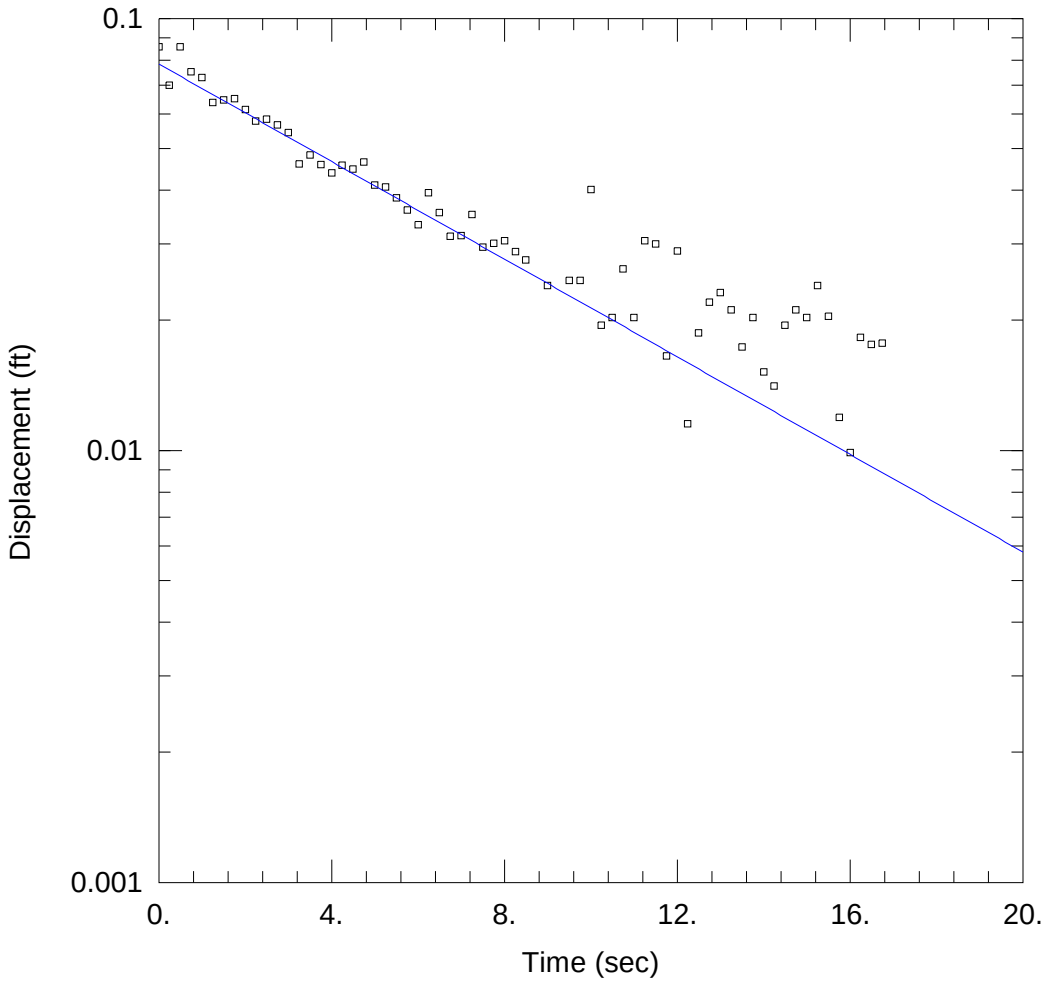
SOLUTION

Aquifer Model: Unconfined Solution Method: Moench

T = 0.0001324 m^2/sec
Sy = 0.001
Sw = -0.45
r(c) = 0.1667 ft

S = 0.008161
Kz/Kr = 0.2596
r(w) = 0.1667 ft
alpha = 1.0E+30 sec^{-1}

Aqtesolv Data Sheets
Slug Tests



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed slug tests\mw50\MW50.aqt
Date: 06/17/16 Time: 11:30:49

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW50
Test Date: 5/16/16

AQUIFER DATA

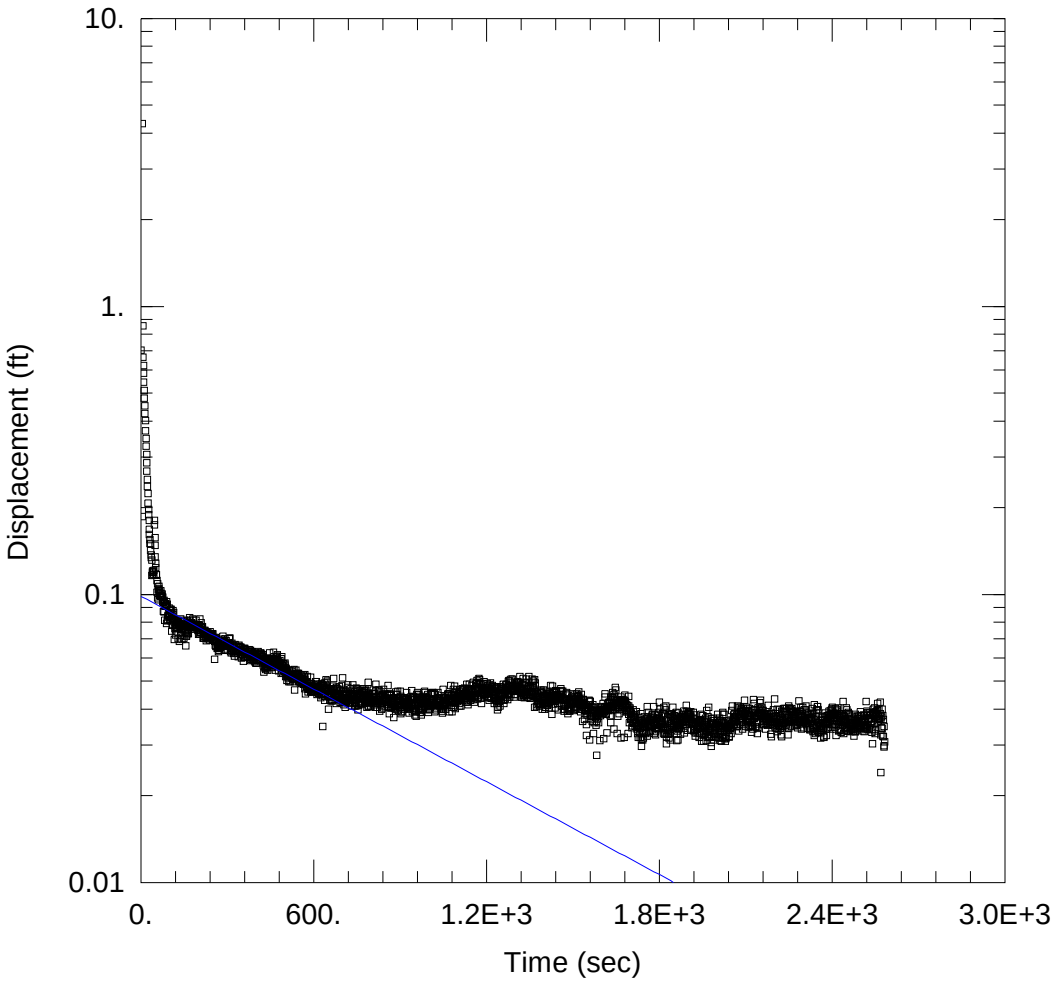
Saturated Thickness: 8.54 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW50)

Initial Displacement: 0.086 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.083 ft
Static Water Column Height: 1. ft
Screen Length: 15. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 8.461E-5 m/sec
y0 = 0.07831 ft



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed slug tests\mw62 slug\mw62slug.aqt
Date: 06/20/16 Time: 09:19:44

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: MW62
Test Date: 5/16/16

AQUIFER DATA

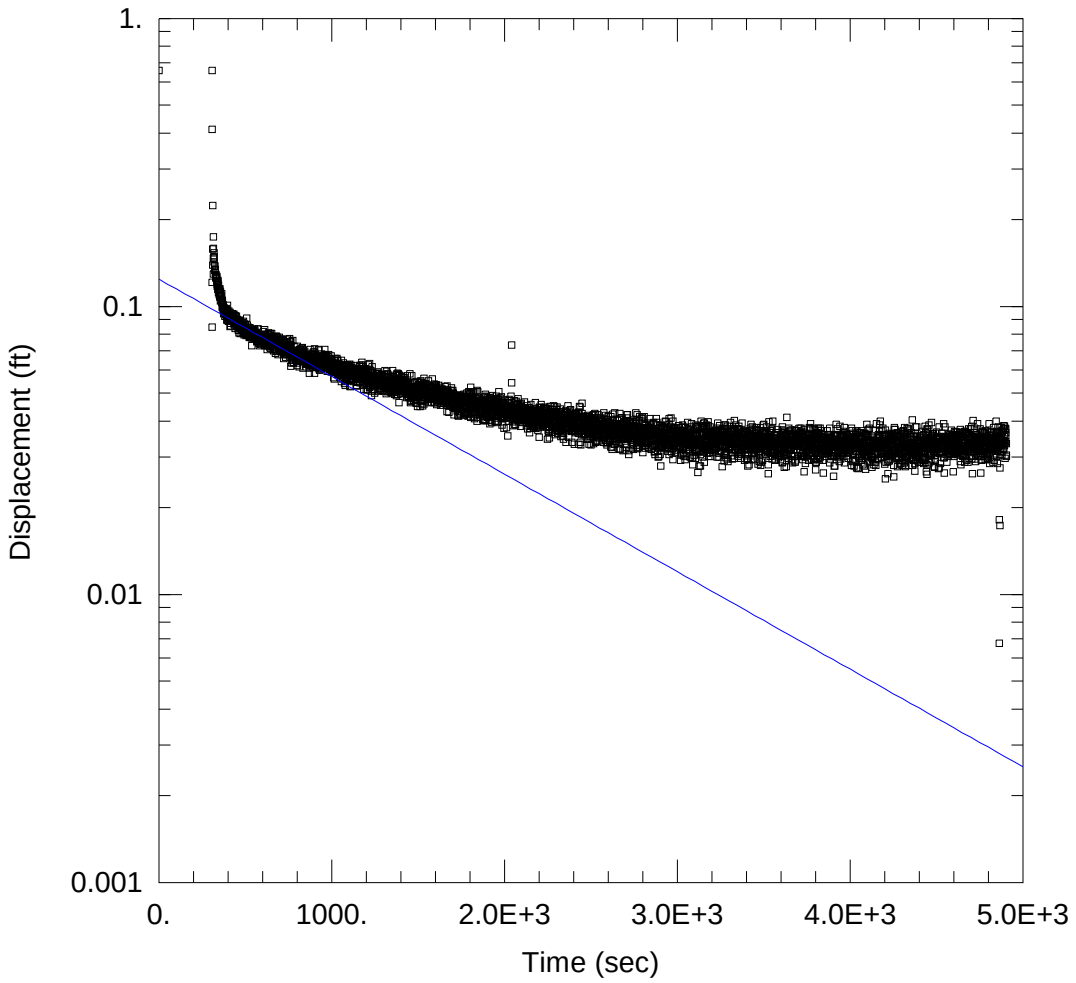
Saturated Thickness: 8.52 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (mw62)

Initial Displacement: 0.7031 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.083 ft
Static Water Column Height: 8.52 ft
Screen Length: 15. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined
K = 7.398E-7 m/sec
Solution Method: Hvorslev
y0 = 0.0938 ft



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed slug tests\pw1slug\PW1SUG.aqt
Date: 06/17/16 Time: 11:29:06

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW1

AQUIFER DATA

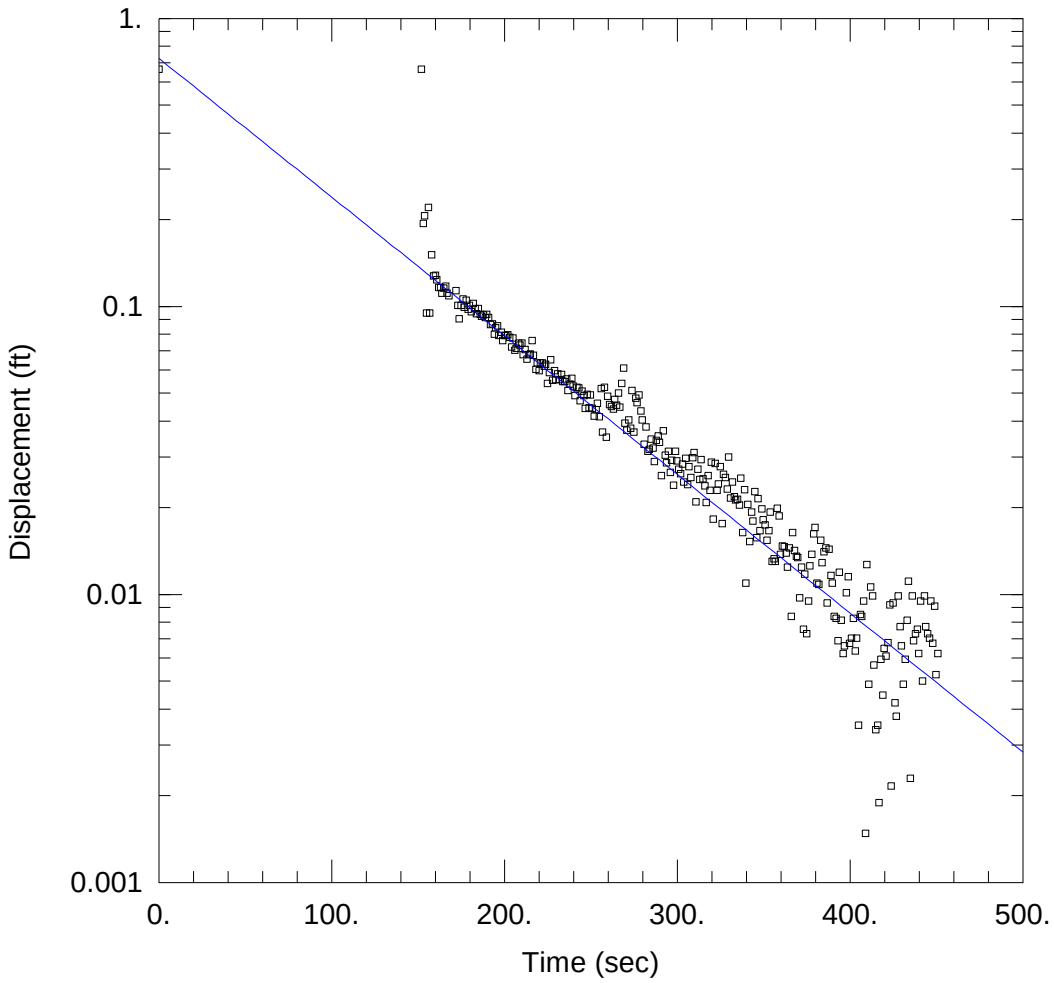
Saturated Thickness: 16.18 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (pw1)

Initial Displacement: 0.659 ft
Total Well Penetration Depth: 16.18 ft
Casing Radius: 0.083 ft
Static Water Column Height: 16.18 ft
Screen Length: 15. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 3.843E-7 m/sec
y0 = 0.1243 ft



WELL TEST ANALYSIS

Data Set: C:\Users\ruttand\Documents\UTC SYRACUSE\analysed slug tests\pw2slug\PW2SLUG.aqt
Date: 06/17/16 Time: 11:28:21

PROJECT INFORMATION

Company: AECOM
Client: UTC
Project: 60480273
Location: Syracuse
Test Well: PW2

AQUIFER DATA

Saturated Thickness: 13.2 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PW2)

Initial Displacement: 0.6672 ft
Total Well Penetration Depth: 17.2 ft
Casing Radius: 0.083 ft
Static Water Column Height: 13.2 ft
Screen Length: 15. ft
Well Radius: 0.26 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 4.675E-6 m/sec
y0 = 0.7264 ft