Prepared for:

RHEEM MANUFACTURING COMPANY
138 Roberson Mill Road N.W.
Milledgeville, GA 31061

VOLUNTARY REMEDIATION PROGRAM
PROGRESS REPORT # 5
Rheem Manufacturing Company
Milledgeville, Georgia

Prepared by:

1050 Crown Pointe Parkway, Suite 550
Atlanta, Georgia 30338
Tel: 404-315-9113

June 2016

VOLUNTARY REMEDIATION PROGRAM
PROGRESS REPORT #5

RHEEM MANUFACTURING COMPANY
MILLEDGEVILLE, GEORGIA

Prepared For:

RHEEM MANUFACTURING COMPANY
138 Roberson Mill Road N.W.
Milledgeville, GA 31061

Prepared By:

1050 Crown Pointe Parkway, Suite 550
Atlanta, GA 30338
Tel: 404-315-9113

Justin Vickery, P.G.

June 2016

EPS

VOLUNTARY REMEDIATION PROGRAM PROGRESS REPORT #5
RHEEM MANUFACTURING COMPANY
Milledgeville, Georgia

June 2016

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

VOLUNTARY REMEDIATION PROGRAM PROGRESS REPORT #5
RHEEM MANUFACTURING COMPANY
Milledgeville, Georgia

GROUNDWATER SCIENTIST STATEMENT

I certify that I am a qualified ground water scientist who has received a baccalaureate or post-graduate degree in the natural sciences or engineering, and have sufficient training and experience in ground water hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that this Progress Report was prepared by me or by a subordinate working under my direction.

Certified by: 

Justin D. Vickery, P.G.
Associate
No. 1745

Date: 6-10-16

1 INTRODUCTION

1.1 Summary

This Voluntary Remediation Program (VRP) Progress Report is submitted on behalf of Rheem Manufacturing Company (Rheem) for the former Rheem manufacturing facility (Facility) located at 138 Roberson Mill Road in Milledgeville, Georgia (Property). The purpose of this Progress Report is to describe the activities conducted during the current reporting period (November 2015 through April 2016) and to discuss planned activities for the next reporting period. Specifically, this Progress Report includes: (i) an update to the Milestone Schedule, (ii) an update on the activities completed during this reporting period, (iii) an update to the Conceptual Site Model (CSM), (iv) a discussion of the effectiveness of ongoing remedial actions, (v) a final voluntary investigation and remediation plan (VIRP) to bring the Property into compliance with a Type 5 Risk Reduction Standard (RRS), and (vi) a discussion of the planned activities for the next reporting period.

1.2 Background

The Facility was used for the manufacturing of domestic air conditioning units and furnaces from 1978 until it ceased operations in 2009. The Property is comprised of 41.12 acres and is primarily improved with a vacant manufacturing and office building, and an asphalt-paved parking lot. It is fenced and has full time security. A regional topographic map of the surrounding area is shown on Figure 1 (all figures are included in the Figures attachment). An aerial photograph of the Property is included as Figure 2A, and an aerial photograph of the Property and surrounding area is included as Figure 2B.

In September 1988, a release of reclaimed trichloroethene (TCE) was discovered by Rheem and reported to the Georgia Environmental Protection Division (EPD). The release occurred in the tank farm area from underground piping connecting two aboveground TCE storage tanks (TCE ASTs) to a parts washer inside the Facility. The quantity and duration of the TCE release are unknown. A groundwater recovery system, which is still in operation, was installed in 1989-1990 to remediate TCE in groundwater. Since that time, Rheem has performed ongoing assessment and remedial action activities with oversight by the EPD Land Protection Branch.

2 VRP PROJECT MANAGEMENT

2.1 Professional Geologist Oversight

This Progress Report includes a certification by Justin Vickery, P.G., the Professional Geologist specified in the VRP application. Appendix A contains a monthly summary of hours invoiced by the P.G.

2.2 Milestone Schedule

An updated milestone schedule is included in Appendix B.

3 RECENTLY COMPLETED ACTIVITIES

3.1 Overview

Section 3 discusses activities conducted between November 1, 2015 and April 30, 2016, including:

- off-Property groundwater delineation,
- off-Property groundwater monitoring,
- the operation of the Accelerated Remediation Technology (ART) system and the addition of three ART remediation wells to expand the geographical reach of the system,
- on-Property groundwater remediation,
- on-Property vadose zone remediation, and
- installation of additional sub-slab depressurization system piping beneath portions of the former Rheem building to expand the geographical reach of the system.

3.2 Assessment and Monitoring

3.2.1 Off-Property Monitoring Well Installation and Sampling

On January 25-28, 2016, monitoring well MW-54 was installed using rotosonic methods at the location shown on Figure 2B to refine the northern delineation of TCE in groundwater off and immediately west of the Property. Continuous cores were collected, and the boring was advanced to a depth of 142 feet below the ground surface (ft-bgs). The boring was completed as a 2-inch, Schedule 40 PVC well with a screened interval of 130 to 140 ft-bgs. A sand pack was placed around the screen at 128 to 142 ft-bgs, and a bentonite seal was placed from 126 to 128 ft-bgs and allowed to hydrate. The remainder of the well annulus was grouted with a bentonite grout. The well was completed with a locked well cap and a flush-mounted well vault. Boring logs and well construction information are included in Appendix C, and Table 1 (Tables 1-7 are included in the Tables attachment) presents an overview of the well construction details.

On January 29, 2016, MW-54 was developed and on February 26, 2016, the well was purged using low flow/low volume methods until geochemical parameters stabilized, and a groundwater sample was collected for volatile organic compounds (VOC) analysis. Methylene chloride was detected in the sample at a concentration of 8.3 micrograms per liter (µg/L)[1]. No other VOCs were detected. The laboratory report is provided in Appendix D. The development log and well purge forms are included in Appendix E.

[1] Methylene chloride is a common laboratory contaminant. Given the trace level detected, and the fact that methylene chloride has not been detected historically in the off-Property monitoring wells and, as indicated below, was not subsequesntly detected in MW-54, this detection is attributed to the lab.

3.2.2 Off-Property Groundwater Monitoring

On April 26-28, 2016, the network of off-Property monitoring wells (MW-33, MW-34, MW-35, MW-36, MW-43, MW-44, MW-45, MW-46, MW-47, and MW-54) were gauged with a water level meter, purged, and sampled for VOCs. The wells were purged using low flow/low volume methods. Purge forms are included in Appendix E.

The groundwater flow direction was to the south-southwest, similar to the direction specified on historical potentiometric surface maps. Figure 3 is a potentiometric surface map for the April 2016 gauging event. Table 3 summarizes recent groundwater elevations.

Consistent with historical results, TCE was detected in samples collected from MW-33 (90 µg/L), MW-34 (60 µg/L), MW-43 (150 µg/L), and MW-46 (23 µg/L), but was not detected in MW-35, MW-36, MW-44, MW-45, MW-47, or MW-54. Also, consistent with historical data, cis-1,2-dichloroethene (cDCE) was detected in samples collected from MW-33 (31 µg/L) and MW-43 (7.5 µg/L), but was not detected in the other wells. TCE results are shown on Figure 4 and summarized in Table 2. Methylene chloride was not detected in MW-54 for this sampling event, reinforcing that the detection in the February sample was due to lab contamination. The April laboratory report is included in Appendix D. Table 2 provides a sampling history for TCE in the off-Property monitoring wells.

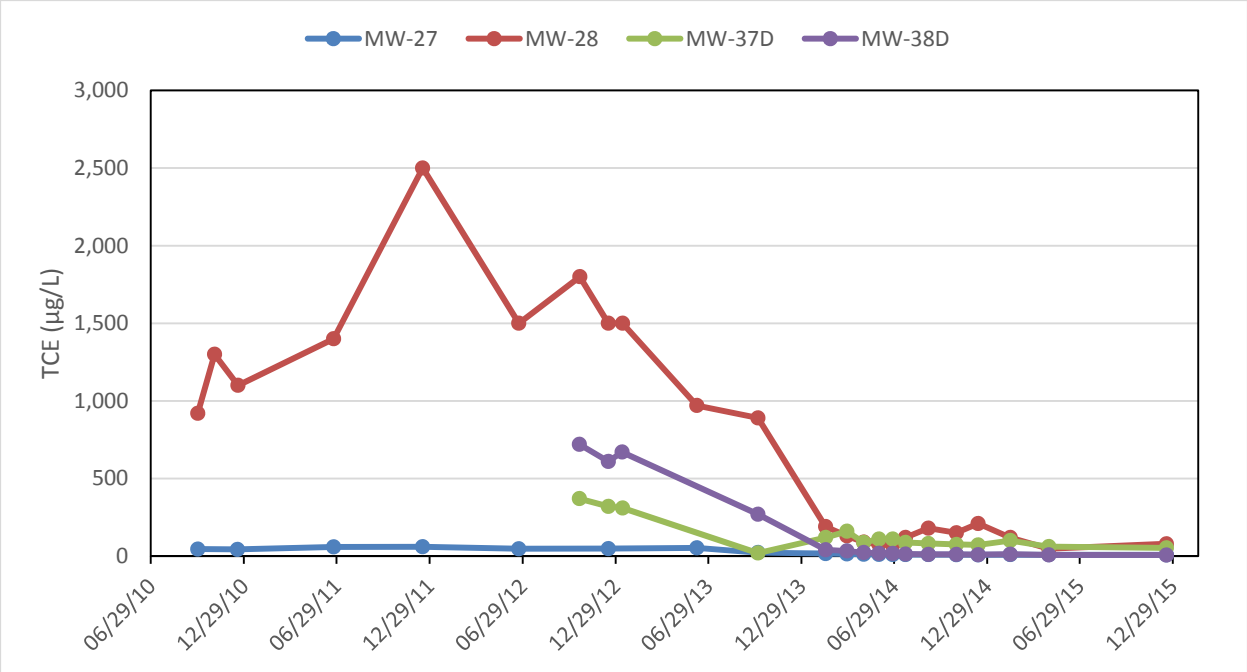
3.3 Remediation

3.3.1 Groundwater Remedial Action

3.3.1.1 Property Line ART System

During the current reporting period, operation of the property line ART system continued with all ART wells (ART-1 through ART-5) active. The ART remediation wells are located within the area of highest TCE concentrations detected in groundwater at the Property's western boundary. The goal of the ART system is to reduce the mass flux of TCE exiting the Property, allowing natural attenuation processes along the continued flow path of groundwater to address the lesser VOC flux condition. ART system VOC monitoring was performed once during the current reporting period. As shown in the chart below, TCE concentrations in groundwater passing through the ART well network are being significantly reduced. The following graph presents results from previous sampling events and illustrates the effectiveness of the ART system in substantially decreasing TCE concentrations and mass flux off-Property.

TCE Test Results for ART Performance Monitoring Wells



Monitoring wells MW-37S, MW-38S, and MW-39 are not included on the chart because TCE has not been detected in these wells.

3.3.1.2 ART System Expansion

On February 16-26, 2016, three new ART remediation wells (ART-6, ART-7, and ART-8) were installed to the north of the existing ART well network, as shown on Figure 5. The new ART wells were installed to extend the geographic reach of the ART system and further reduced flux of VOCs off-Property. Details of the system expansion in the context of the final remediation strategy are provided in Section 6 (final VIRP).

3.3.1.3 Groundwater Pump-and-Treat System

Operation of the groundwater recovery (pump-and-treat) system continued for this reporting period. The system consists of four recovery wells (RW-1 through RW-4), each with either a down-hole pump or an injection pump, piped to an air stripper. Treated groundwater is discharged to the City of Milledgeville publicly owned treatment works. The pump-and-treat operations will be discontinued [2] in the near future in favor of an alternate remediation approach, described in the VIRP Section (Section 6.1.2) of this Progress Report.

3.3.2 Soil (Vadose Zone) Remedial Action

A soil vapor extraction (SVE) system, consisting of a 40 horsepower (HP) blower connected to 40 hydraulic fracture wells (see Figure 6), was previously installed to extract VOCs from the vadose zone soil in the area of the TCE release. SVE system operations were initiated in April 2015.

[2] Cessation of the pump-and-treat operation was described in Appendix H of the Updated VRP Application (Dec 2012).

Vapor was treated during the initial SVE operations using a catalytic oxidizer and an air scrubber. This setup was operated until January 2016, then converted to activated carbon treatment as the VOC recovery rate diminished. A estimated total of 12,506 pounds (lbs) of VOC were removed as of January 2016. SVE operations resumed on April 7, 2016, following installation of two 2,000-pound carbon vessels. Going forward, the mass of extracted TCE will be determined after each carbon change-out.

3.3.3 On-Property Sub-Slab Depressurization System Installation

Previous progress reports described vapor intrusion (VI) assessment and corrective action measures undertaken by Rheem for the Facility. An expansion of a sub-slab depressurization piping system was installed in April 2016 in the portion of the warehouse to the east of the TCE release area in a 30,000 square feet (sq ft) room of the Facility. The additional piping consists of five lines of 3-inch diameter perforated Schedule 40 PVC pipe totaling 658 linear feet. The five individual lines extend to the exterior of the building via solid piping through a trunk line trench. Figure 7 shows the layout of the newly and previously installed sub-slab depressurization system lines.

4 UPDATED CONCEPTUAL SITE MODEL

4.1 Refined Interpretation of the Site Geology

A thorough review of all boring logs for the Rheem site was conducted in the course of this CSM update, including logs from the early site assessment work in the late 1980s (work performed by Law Environmental). Drilling methods in the 1980s followed geotechnical engineering practices, where soil boring involved hollow-stem auger drilling with split-spoon soil sampling and Standard Penetration Testing (or Blow Counts) on 5-ft vertical centers, and double-barrel coring was the common method when drilling deeper into rock. The conventions developed by Sowers (1963) and others for describing the properties of Piedmont geology were based upon these drilling and testing techniques, whereas the modern drilling methods such as direct-push and rotosonic drilling (employed at the Rheem site for the more contemporary site assessments) do not provide the same level of information to accurately log the boring with respect to depth to PWR and depth to rock.

The original Sowers (1963) classification schemes comprised of four zones based upon relict structure and geotechnical properties, as follows:

- Soil — no relict structure; "Blow Count (N)" = 5-50
- Saprolite — exhibits relict parent rock structure; N = 5-50
- PWR — alternating hard & soft seams; N > 50
- Rock (or bedrock) — RQD (a core quality property) > 75%

Wilson and Martin (1996) provide a chart of various classification schemes as shown below:

Table 1. Classification systems of weathering profiles (from Wilson and Martin, 1996).

Sowers (1963)	Deere & Patton (1971)		Law/MARTA (Richardson & White, 1980)	Schnabel Engineering Associates (from Martin, 1977)
Soil N=5-50	I Residual Soil	IA A Horizon	Upper Horizon No Residual Structure	Residual Soil N < 60
		IB B Horizon		
Saprolite N=5-50		IC C Horizon	Saprolite	
Partially Weathered Rock - Alternate Hard & Soft Seams N>50	II Weathered Rock	IIA Transition From Residual Soil to Partially Weathered Rock	Partially Weathered Rock N>100 Core Recovery<50%	Disintegrated or partially weathered rock N≥60
		IIB Partly Weathered Rock	Rock Core Recovery>50% RQD<50%	Rock N≥100/2" Core For Confirmation
Rock RQD>75%	III Unweathered Rock RQD>75%		Sound Rock RQD>50% Core Recovery>85%	
RQD = Rock Quality Designation N=Standard Penetration Test N-Value (blows/foot)				

The primary factors in the geologic interpretation from the boring logs includes: (1) the blow count (or "N" value), the Core Recovery (% REC) and Rock Quality Designation (% RQD). A revised interpretation of the geologic zone screened by each well was made for the Rheem site, as illustrated on Table 4. Saprolite extends at the Rheem site to depths ranging from as shallow as about 10ft-bgs to as deep as about 60 ft-bgs. Previous interpretations of these logs also mistook auger refusal and/or the beginning of rock coring as indicative of the PWR/rock interface. This is not consistent with conventional classification schemes such as Sowers (1963), where the % RQD (and by other schemes also the % REC) is considered in discerning between PWR and rock. Exhibit 1 provides a revised geologic interpretation for four deep bedrock wells (MW-3A, MW-5, MW-6, and MW-12A) installed by Law Environmental in the late 1980s: note in all instances the true depth of the PWR/bedrock interface is greater than the original interpretation provided on the boring log. The PWR thickness in these borings is generally between about 30 to 40 ft. The implication of the refined interpretation is important in that it recognizes that the PWR exhibits the highest permeability relative to the overlying saprolite and underlying bedrock.

Interpretations for borings drilled by rotosonic methods are less precise owing to several factors:

- N values and RQD/REC values are not derived;
- The vibratory nature of the drilling method can disturb the physical character of the core, pulverizing rock and giving the appearance of PWR; and
- The quality of the core (i.e., degree of physical disturbance) varies according to the skill of the drill rig operator.

Thus there is greater variability in the logged depth of the saprolite/PWR and PWR/bedrock interfaces with the rotosonic borings as reflected on Table 4.

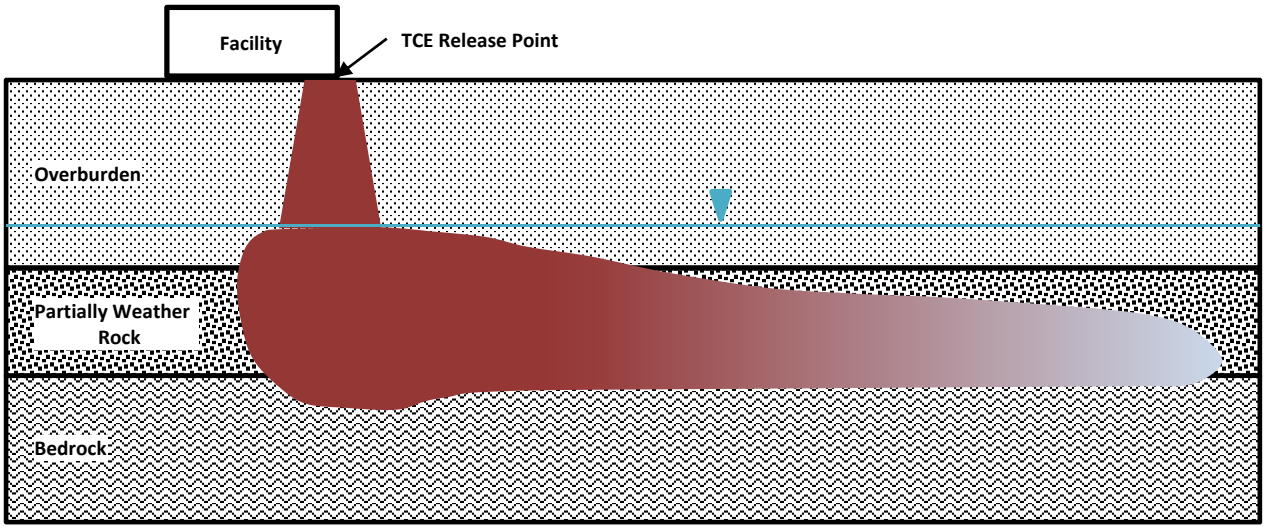
Hydrogeologic cross sections have been updated to reflect the refined geologic interpretations, and the additional boring/well installations since the last presentation of cross sections. Figure 8A shows the locations of the cross sections, and the hydrogeologic cross sections are provided on Figure 8B (along the direction of groundwater flow) and Figure 8C (along the western property line).

4.2 TCE Distribution with Respect to the CSM

4.2.1 TCE Release

The CSM, as provided in the VRP application and schematically illustrated below, exhibits the characteristic behavior of a DNAPL release, with primarily vertical migration downward from the release point until the DNAPL encounters a low permeability zone (*e.g.,* bedrock), at which point DNAPL may saturate the aquifer pore space if sufficient DNAPL was released. The downward vertical migration of DNAPL leaves in its path residual product no longer capable of migrating as a pure phase, but acts as a continuing source of DNAPL constituents to groundwater. In the case of a significant release, the residual phase will occur at the soil saturation concentration ("Csat"). Potentially the largest source of DNAPL as provided in the CSM occurs at the interface of PWR and bedrock, resulting in an elevated groundwater condition at depth that exceeds the groundwater concentrations in the surficial aquifer, a condition observed at the Rheem Site.

4.2.2 Summary of TCE Distribution



- The pattern of TCE distribution in the vadose zone soil and underlying aquifer (groundwater) is consistent with the geologic setting described above and the reported distribution of TCE.TCE is present across the vertical profile of vadose zone soil beneath the area of the product release, indicating DNAPL transport through the soil into the underlying aquifer matrix. Very little lateral spread of the condition occurred.

- TCE is present in groundwater in all three hydrogeologic settings (saprolite; PWR; bedrock) beneath the area of the TCE release, at levels characteristic of a DNAPL source being present.
- Free-phase DNAPL has never been observed in the site monitoring wells, even in the source area. This indicates the DNAPL is in the residual saturation state, i.e., present as globules entrained in the aquifer matrix. There is no mobile DNAPL.
- The dissolved-phase TCE emanating from the source area is mature and likely has been at steady state for a number of years. The measured concentration of TCE at a given location/depth is not expected to increase in the future. Moreover, with the additional release area remediation measures planned for the Site (see final VIRP, Section 6 of this document), the TCE plume extent and magnitude will decrease over time.
- Depth-profile sampling of TCE in groundwater, conducted at numerous boring locations across the Site (on- and off-property) shows that the shallow groundwater (saprolite zone) away from the source area exhibits a lower concentration relative to deeper groundwater (PWR zone). This is consistent with the CSM in that the PWR is the primary flux zone owing to its higher relative permeability.

4.3 Potential Receptors and Exposure Pathways

4.3.1 Property Usage

The Property includes a single-story former manufacturing facility building (approximately 12 acres under roof) and a parking lot located to the northwest of the building. The former manufacturing facility is not in operation and there are no full-time Rheem employees at the Property. There is a security service at the Property as well as a periodic inspection/maintenance service contractor and a landscaping contractor who maintains the grounds on an as needed basis. Rheem is marketing the Property for sale and productive re-use as a commercial/industrial operation.

The adjoining properties are used for commercial purposes or are currently vacant. The majority of the area near the Rheem facility is zoned for commercial land use with pockets of single family homes to the north and west of Roberson Mill Road and to the east of North Columbia Street. The nearest residential area is a townhome neighborhood approximately 1,000 feet from the northwest corner of the Property.

4.3.2 Well Survey

The Property and the surrounding area are serviced by public drinking water systems. The City of Milledgeville and Baldwin County Water Authority are not aware of any drinking water wells in the vicinity of the Rheem Property. A 2001 private well survey map generated by EPD as part of a HSRA release notification trip report for a nearby facility indicated that there was one private well approximately 3,200 ft to the west of the western Property boundary; however, according to

the property owners there is not a well in use at the property[3]. There is a private well at a residence located at 120 Meriweather Circle, approximately 2,700 ft to the southwest of the western Property boundary, which may be used periodically for irrigation. Rheem sampled the irrigation well at 120 Meriweather Circle on September 25, 2012, and no constituents were detected.

4.3.3 Potential Receptors

4.3.3.1 Overview

Potential current and/or future human receptors are listed below along with a brief discussion of the rationale behind their identification and the pathways through which they could potentially be exposed to VOCs associated with the TCE release. These potential receptors and exposure pathways are diagrammed in Figure 9. On-Property receptors may be exposed to constituents released at the Property through contact with soil or air. Drinking water for the Property is provided by public drinking water systems, and there is no use of groundwater on the property. Potential On-Site Receptors

Current/Future Site Worker: There are no current manufacturing workers at the site; however, there are contract security personnel who work approximately 40 hours per week at the site. In the future, the facility may be returned to commercial/industrial use. Site workers could potentially have intermittent long-term exposure to site-related chemicals in surface soil via ingestion, dermal contact, and inhalation of volatiles in outdoor air. This potential receptor may also be exposed to vapors potentially migrating (vapor intrusion) from impacted groundwater and vadose zone soils to the indoor air of existing and/or future buildings.

Current/Future Groundskeeper: The grounds are currently maintained by a landscaping contractor on an as-needed basis, and landscaping activity is likely to be required for any future use scenarios. Groundskeepers could potentially have intermittent long-term exposure to Property-related chemicals in surface soil via ingestion, dermal contact, and inhalation of volatiles.

Future Adolescent Trespasser: Access to the Property currently is restricted by fencing and security. Although these types of restrictions are likely to continue, trespassers hypothetically could have easier access to the Property in the future. The most frequent trespassers would likely be adolescents with intermediate-term (6 years) exposure to the Property, who could be potentially exposed to chemicals in surface soil via ingestion, dermal contact, and inhalation of volatiles.

Future Construction Worker: No construction activities are currently planned at the Property, however, it is possible that additional or replacement buildings could be constructed on the Property in the future. Construction workers could potentially have short-term (<1 year)

[3] Although no address is provided, the EPD survey map provides a "household" designation and indicates that the well belonged to a Burnice King. On June 24, 2010 a Rheem employee visited the area shown on the EPD survey map to investigate the well. He learned that Burnice King was deceased and that one of her daughters was living in Mrs. King's former home at the corner of Meriwether Circle and Highway 212. Another daughter of Mrs. King stated that there was no private well on the property and that the City of Milledgeville has provided water to the residence since the 1940s.

intermittent exposure to chemicals in mixed surface and subsurface soil (0-10 ft-bgs) via ingestion, dermal contact, and inhalation of volatiles.

Future Resident: Future residential use of the Property is highly unlikely as the Property is zoned commercial/industrial, but is discussed here for completeness. Hypothetical future residents on the Property could potentially have long-term exposure to Property-related chemicals in surface soil via ingestion, dermal contact, and inhalation of volatiles in outdoor air. This potential receptor could also be exposed to vapors potentially migrating from impacted groundwater and vadose zone soils to the indoor air of future residential dwellings. A barrier to mitigate vapor migration presumably would be used for any future residential construction.

Ecological Receptors: The area impacted by the TCE release is mostly covered by buildings or pavement and does not represent quality habitat for wildlife, as it lacks natural vegetative cover. Disturbance from vehicles, facility operations, and mowing likely have disturbed and will continue to disturb wildlife and cause animals to seek less frequently disturbed areas.

4.3.3.2 Potential Off-Property Receptors

Current/Future Commercial Workers: There are some businesses to the southwest of the Rheem Property in the general direction of groundwater flow. These businesses are serviced by public drinking water systems and have no drinking water wells. Given the concentrations of TCE detected in off-Property groundwater and the depth at which those concentrations have been detected, it is unlikely that off-Property commercial workers could be exposed to vapors migrating from impacted groundwater to the indoor air. However, for purposes of this assessment, off-Property commercial workers have been included as a potential receptor via this pathway.

Current/Future Resident: There are some single family and multi-family residences within a half-mile of the western boundary of the Property. These homes are serviced by public drinking water systems. Furthermore, neither this nor any other residential development in the Property vicinity has been impacted by the TCE release at the Property.

Ecological Receptors: No off-Property ecological receptors have been identified. It does not appear that groundwater has impacted two identified surface water features, Fishing Creek, which is located approximately ¼ mile to the southwest of the Property and a small unnamed pond, located approximately ½ mile southwest of the Property. The small unnamed pond was evaluated on September 25, 2012 by collection of a surface water sample. No constituents were detected[4].

4.4 Point of Demonstration and Exposure

Under the VRP regulations, the Point of Exposure (POE) is the nearest of the following: the closest existing downgradient drinking water well, the likely nearest future downgradient drinking water well, or at a hypothetical point of exposure 1,000 feet downgradient of the plume edge. The nearest drinking water well is greater than 1,000 feet downgradient of the plume edge. The Property is largely surrounded by commercially developed or unoccupied property with residential property beyond the known down-gradient edge of the TCE plume. All properties in these surrounding

[4] Surface water analyzed for TCL Volatile Organics (SW8260B).

developments are serviced by a public water supply. Thus, the POE for this Property is a hypothetical point 1000 feet downgradient from the plume. MW-34 is the furthest down-gradient monitoring well with a detection of TCE. Accordingly, the appropriate Point of Demonstration (POD) is monitoring well MW-47, which is non-detect for TCE and is the nearest down-gradient well to the edge of the plume (MW-34). The POE and POD are shown on Figure 10.

5 RISK ANALYSIS

5.1 Overview of the Risk Analysis Process

The risk analysis presented in this section of the report builds upon the identification of potential receptors and exposure pathways presented in Section 4.4, by examining the applicable risk-based criteria for three primary modes of exposure: soil (dermal contact; ingestion), groundwater (ingestion), and vapor intrusion (inhalation). In the context of a VIRP, soil and groundwater data are evaluated with respect to RRS criteria, whereas for vapor intrusion the data are evaluated with respect to risk/hazard threshold levels.

5.2 Development of RRS

RRS have been calculated for the regulated constituents detected in soil and groundwater[5]. The calculations for Type 1 through Type 4 RRSs are shown in Appendix F. Type 1 and 2 are designed to be protective of residential use, and Types 3 and 4 are designed to be protective of non-residential use.

5.3 Soil Risk Analysis

In Table 5, the maximum soil concentrations for regulated substances detected are compared to the non-residential RRSs (the higher of the Type 3 and Type 4 RRS, see Appendix F). Non-residential RRSs differ for surface soils ("SS," less than or equal to 2 ft-bgs) and subsurface soils ("SB," greater than 2 ft-bgs). Accordingly, Table 5 shows a comparison of the surface soil results to the surface soil RRS and subsurface soil results to the subsurface soil RRS. The maximum concentrations are taken from all soil data collected from the Property. This table shows that TCE is the only constituent that exceeds its RRS.

The VRP Program does not require a point-by-point comparison to RRSs, but instead allows remedial action decisions based on area-averaging of the Property conditions. This method involves using a representative concentration (generally the 95% upper confidence limit on the arithmetic mean, "95%UCL") to represent the exposure of a receptor to the soil. This representative concentration can then be compared to the RRSs to determine whether or not the soil is in compliance with the RRSs. Accordingly, the 95% UCL for TCE was calculated using the robust statistical model Pro UCL (USEPA, 2007). Table 5 shows that the 95% UCLs of all the soil data exceed the RRSs.

The use of the Property-wide soil data is not representative of the actual exposure a receptor might have to soil at the Property. There is an active SVE treatment system in operation in the release

[5] Type 1 RRS were originally developed in the October 2012 VRP Application. In the current Progress Report, Type 1 RRS have been updated, and Type 2-4 RRS have been developed.

area. This means that soil data collected in this area prior to the start-up of the treatment system is not representative of current concentrations in that area, which are anticipated to be lower. Additionally, the building provides a barrier to human exposure to the subsurface directly under the building slab. Accordingly, a new 95% UCL, representing a more realistic future exposure scenario, has been calculated to exclude these two areas, and is posted on Table 5. The new 95% UCL for surface soil is 0.5 milligrams per kilogram (mg/kg), which is at the RRS for surface soil (0.5 mg/kg). The new 95% UCL for subsurface soil is 3.9 mg/kg, which exceeds the RRS for subsurface soil (0.5 mg/kg).

The surface and subsurface soil TCE RRS of 0.5 mg/kg is developed from a simplistic soil-to-groundwater leaching input (see in Table L "Table 1 GW x 100 factor" column) (Tables A-N are included in Appendix F). This represents a threshold concentration that presumably is protective of groundwater (i.e., the underlying groundwater condition will not exceed the groundwater drinking standard from a soil leaching flux input). This RRS value does not reflect risk to direct exposure to soil – for that, one must look to what is called "Item2" on Table L where direct exposure threshold values are posted (see Tables F and G where the posted values are calculated). The direct soil exposure RRS for TCE is 7.1 mg/kg. This derivation of the soil RRSs (direct exposure) is more applicable in the context of the VRP, which allows for groundwater to be above drinking water standards except at the POE.

5.4 Groundwater Risk Evaluation

Recent groundwater data (2014-2016) are compared to the RRSs in Table 6. The groundwater data on-Property and off-Property are compared to both residential and non-residential groundwater RRSs. For the primary constituents of interest (TCE and to lesser extent vinyl chloride), there is negligible difference between the residential and non-residential RRSs. The groundwater on-Property exceeds the RRSs for TCE and vinyl chloride in a number of wells. There was one exceedance out of 42 samples of 1,1,2-trichloroethane. Based on these results, groundwater on-Property cannot be certified to RRSs.

The groundwater data for samples collected off-Property is above the TCE RRSs in approximately half of the samples. The vinyl chloride RRSs were exceeded in only one well (MW-33). Four vinyl chloride samples have been collected from this well. Two of the samples were non-detect (<0.002 mg/L) and the other two samples (highest 0.0054 mg/L) were above the Residential RRS (0.002 mg/L) and the Non-Residential RRS (0.0033 mg/L).

In the VRP program, groundwater is evaluated for the hypothetical POE, which can be established by utilizing data collected from the POD well. The POD well (MW-47) is located approximately 100 to 200 feet down-gradient from the edge of the plume. As noted above, results from MW-34 are non-detect. Based on this information, groundwater concentrations of TCE at the POD are below the Residential and Non-Residential RRS.

5.5 VI Risk Evaluation

5.5.1 Rheem Facility VI Evaluation

Previous VI assessments of the former Rheem facility have been reported in prior VRP progress reports. These assessments led to installation of a sub-slab depressurization piping network, designed to capture VOCs in soil gas prior to permeation of the slab and entry into the building areas.

5.5.2 Off-Property VI Evaluation

A VI assessment has been conducted for off-Property groundwater conditions, following standard EPA protocols, and is included in Appendix G. The assessment considered the EPA Vapor Intrusion Screening Level (VISL) calculator, and the Johnson & Ettinger Model (JEM). An incomplete pathway for VI exists for the groundwater condition west of Roberson Mill Road as the TCE is present beneath a substantial (> 40 ft) clean water lens. Off-Property groundwater TCE concentrations east of Roberson Mill Road are above the range of commercial and residential VISLs that apply at the point of exposure. Therefore, a comparison of off-Property TCE conditions to area specific JEM screening values was performed to assess potential risk. In addition, comparison of off-Property TCE concentrations to JEM screening values indicates that the properties adjacent to and east of Roberson Mill Road exhibit groundwater TCE concentrations that are below the screening value of 10^{-5} for both residential and commercial land use. Thus, it is concluded that VI risk based on off-Property groundwater conditions is negligible.

6 FINAL VIRP

6.1 Overview of the Final VIRP

Rheem has implemented a number of remedial actions in response to the TCE release in 1988. The initial response involved soil excavation (with off-Property disposal) reportedly along the area of the subgrade piping (from the AST to the building). After initial groundwater assessment work, Rheem installed and has continued operating a groundwater pump-and-treat system comprised of four remediation wells bracketing the TCE release area.

Based on discussions between Georgia EPD and Rheem in the 2008-10 time frame concerning the continued effectiveness of the pump-and-treat system in achieving remediation goals, additional assessment activities were implemented. Upon determining that the TCE plume had not been fully contained by the pump-and-treat system, Rheem and EPD recognized that other remediation measures warranted consideration, and that the pump-and-treat was no longer considered to be a comprehensive long-term remedial option. (See Item 2.A, Appendix H to the VRP Application).

Based upon further interactions with EPD on long-term remedial options, the final remediation strategy consists of the following:

- aggressive remediation centered in the area of the TCE release
  - accomplished through SVE for the vadose zone (soil above the groundwater table) and *in situ* bioremediation/bioaugmentation for the saturated zone beneath the water table
- aggressive remediation in the TCE plume downgradient of the release area
  - accomplished through *in situ* bioremediation/bioaugmentation
- active remediation to address ongoing flux of TCE at the down-gradient property line
  - accomplished through the ART remediation wells
- active VI mitigation for the former Rheem facility
  - accomplished through installation and operation of the sub-slab depressurization piping system beneath the building.

Further details of each element of the final VIRP follow.

6.1.1 Soil Delineation Status

Soil delineation is complete. A review of all detected constituents in soil was performed with respect to the applicable Type 1 RRSs (i.e., the delineation criteria, which readily identified TCE as the constituent with the most extensive distribution. Figure 11 shows the TCE soil condition in 5-ft depth increments, where the TCE condition is shown as a multiple of the Type 1 RRS (0.5 mg/kg). The figure illustrates that the horizontal extent of TCE is delineated to the Type 1 RRS

across each depth increment. Vertically, the TCE is generally continuous across each depth increment, *i.e.*, throughout the full extent of the vadose zone to the groundwater table.

6.1.2 Soil VIRP

The SVE system, installed and in operation since April 2015, is comprised of 40 SVE hydraulic fracture wells configured in eight groups of five wells each.

Each frac well was constructed using direct push methods to advance rods into the ground to a specified depth. The rods were pulled up 1-foot from the base of the boring and a high pressure water jet was lowered to the 1-foot interval. The water jet was spun inside the rods, creating a radial notch. The jet tooling was removed, and a slurry, consisting of guar gel[6] and sand, was pumped under pressure into the 1-foot interval, propagating outwards through the radial notch into the clayey soil. The guar gel degraded, leaving a sand lens in place consisting of a disk-shaped area of permeable sand assumed to measure between 500 and 1,000 square feet in area and 1 to 2 centimeters in thickness.

Because the VOCs were detected throughout the vadose zone, fracs were propagated at multiple depths as a 5-well cluster. Installation as a grouping of individualized frac wells allows for individual control of the fracs for SVE purposes. Within some frac well groups, fracs were constructed in 5-foot intervals (*i.e.*, at 5 ft, 10 ft, 15 ft, 20 ft, and 25 ft). In alternating rows of frac well groups, fracs were generally constructed at depths of 7.5 ft, 12.5 ft, 16.5 ft, 21 ft, and 24 ft. Some of the depths of the shallow-interval fracs were modified because the injectant created a path to the ground surface, or "day-lighted," causing any additional injectant to reach the ground surface. Frac well construction is summarized in Table 7, and Figures 12A through 12F show the frac well locations along with the pre-remediation soil concentrations at various depths. Boring logs for the eight frac well groups are included in Appendix C.

To date, a total of 12,506 lbs of TCE has been removed from the vadose zone soils. The early treatment system configuration utilized a catalytic oxidizer unit for vapor treatment, owing to the high VOC extraction rate. As with all SVE Systems, the VOC extraction rate has diminished over time as soil VOC mass depletion is achieved in the vadose zone, allowing a recent conversion to activated carbon treatment for vapors. SVE influent VOC levels will continue to be monitored to track the rate of VOC removal from the soil. At the same point in time, the removal rate will be asymptotic, at which point the SVE operation will be shut down. Subsurface soil will then be sampled across the SVE well network area to characterize the post-treatment conditions.

6.1.3 Groundwater VIRP

6.1.3.1 Groundwater Delineation Status

Horizontal and vertical groundwater delineation are complete. Figure 13 shows horizontal delineation to non-detect.

[6] Guar gel is a non-toxic, plant-based gel used as a carrier fluid for the sand injections.

The vertical distribution of TCE in groundwater was characterized by a combination of vertically discrete packer sampling from borings through the PWR and into bedrock, and vertically-clustered monitoring wells. On the Rheem Property, 6 packer-sampled borings, 9 clustered monitoring well installations, and two monitoring wells provided for a sound characterization of the vertical TCE profile in groundwater (see Figure 14A). The TCE condition in the release area is uniformly higher, in excess of 10 mg/L, across the well cluster profile, which generally spans a depth range of about 40-140 ft-bgs, with the wells mostly in saprolite and PWR (and somewhat into the bedrock). Away from the release area in the down-gradient direction, most of the borings were advanced deeper (to depths of about 200 ft-bgs), with data from these borings showing that the highest TCE concentration is exhibited in the PWR, at a depth range of about 80-150 ft-bgs, with low to non-detect conditions typical of the deepest sampled interval (*i.e.,* around 200 ft-bgs). This characterization is consistent with the CSM.

Based upon data obtained from 5 packer-sample boring locations, the off-Property vertical distribution of TCE is shown on Figure 14B. Non-detect conditions were documented at all locations for the deepest samples (generally at a depth of about 175-190 ft-bgs).

6.1.3.2 Final Remediation Strategy for On-Property Groundwater

The pump-and-treat remediation strategy for on-property groundwater will be concluded during the next reporting period, to be replaced by a remediation strategy involving *in situ* bioremediation/bioaugmentation. The lengthy "life cycle" of pump-and-treat, is well documented in the case history literature. The more recent advent of other groundwater remedial technologies provides for a more effective, shorter-term solution.

Bioremediation will be implemented for two areas of the Property to address the core of the TCE-impacted groundwater, *i.e.*, the area beneath the TCE release area, referred to as the "Release Area Zone", and the area of the down-gradient plume encompassing regions where TCE generally exceeds 10 mg/L, referred to as the "Plume Zone" (Figure 15). The TCE concentration is uniformly elevated in the Release Area Zone across the saprolite/PWR/bedrock vertical profile, as shown in Figure 16A (Shallow Groundwater TCE) and Figure 16B (Deep Groundwater TCE); however the shallow condition in the Plume Zone exhibits relatively low concentrations (<1 mg/L). The deep TCE condition in the Plume Zone is elevated (>10 mg/L), similar to the condition in the Release Area Zone. Vertically, *in situ* bioremediation will be implemented within portions of or the entirety of these two zones, spanning the most elevated TCE groundwater condition, including groundwater in the overburden, PWR and the top of bedrock (*e.g.,* the top 10 to 20 feet of fractured bedrock). The described remedial areas are based on and consistent with the CSM and supporting TCE data for the Property.

Two general strategies will be used for placement of emulsified vegetable oil (EVO) and bioaugmentation culture through injection wells and direct-push injections. Details of the design and implementation plan, including post-injection monitoring, are provided in Appendix H.

The strategy for the Release Area Zone will encompass both methods of media placement. In the region of the former AST tank farm, injection well nests will be installed (Figure 17), with each nest constructed with vertically staggered screen sections to support placement of EVO and bioaugmentation culture across the full thickness of the aquifer. Installation of injection wells

overcomes logistical limits imposed by the high infrastructure density in this area of the Property, as a greater radius of influence and larger injection volumes can be achieved with injection wells. The remaining portion of the Release Area Zone will utilize a dense array of sonic drilling direct injection points, primarily within the interior of the facility (Figure 17). The objective of the Release Area Zone remedial measures is to reduce the mass of TCE in the saturated zone.

The Plume Zone groundwater will be addressed by advancing multiple sonic drilling direct injection points situated in two transects ("biobarriers") oriented perpendicular to the direction of groundwater flow (Figure 17). The objective of the biobarriers is to further reduce VOC mass originating from the VOC release area.

6.1.4 Vapor Intrusion Mitigation

A total of 1,712 linear feet (lf) of 3-inch perforated Schedule 40 PVC sub-slab depressurization system piping has been installed beneath the floor slab in frontal areas of the building that are closest to the TCE release area where the sub-slab VI testing showed a pattern of elevated TCE concentrations (Figure 18). The piping installation was conducted by cutting the floor slab, removing the concrete, removing approximately 9 inches of soil, placing a layer of gravel along the bottom of the trench, placing a filter sleeve on the pipe or wrapping the pipe in geofabric, placing the pipe in the trench, placing #7 (1/2 inch) stone around and on top of the pipe, and re-pouring the concrete slab. The system is configured in three operational zones:

- Zone 1 is the area of the warehouse located to the east of the TCE release area. A 3- to 5-inch crushed concrete base consisting of fine sand and silt size grains was found between the floor slab and the clayey soils. Five lines of perforated pipe, totaling 658 lf, were installed in this area, and each line was individually run to a central location along the western wall via solid 3-inch Schedule 40 PVC pipe.
- Zone 2 is the area of the warehouse located to the south of the TCE release area. A 6- to 10-inch layer of medium to coarse grained sand was found between the floor slab and the clayey soils in this zone. Two perforated pipes running the length of the warehouse area were connected to the exterior wall via a perforated trunk line. There is a total of 797 lf of perforated piping in this area. Five shut off valves, set in flush-mounted vaults, were installed along the piping in this area to accommodate any needed future modifications
- Zone 3 is the office building, located down-gradient of the TCE release area. A layer of crusher run was observed beneath the floor slab in this area. The piping in this area, consisting of two lines totaling 257 lf of perforated piping, was connected to the piping in the warehouse located to the south of the TCE release area, segregated by shut-off valves. Each of the pipes runs up the eastern exterior wall of the office building.

Testing is currently being conducted to size the fans/blowers for the different zones of the building. Future VI assessment will be conducted to test the effectiveness of the VI mitigation measures, likely consisting of re-sampling of the sub-slab vapor probes and re-sampling of indoor air. Enhancements to the existing mitigation system and/or expansion of the system to further reaches of the building will be evaluated as needed to address the potential for personnel exposure (*e.g.*, subsequent reoccupation of the facility by Property workers).

6.1.5 Institutional Controls for the Rheem Property

A Uniform Environmental Covenant (UEC) will be prepared for the Property. The UEC will include a residential use restriction to prevent residential use of the property and a groundwater use restriction to prevent the extraction of groundwater from the property for any reason other than remediation.

6.2 Off-Property Remediation Plan

6.2.1 Overview

The off-Property remediation plan consists of two remedial approaches to mitigate groundwater VOC concentrations. The first entails the ART remediation system, which intersects the VOC plume at the Rheem property line and was constructed for the purpose of addressing ongoing transport of VOCs away from the Rheem property. Through three years of operation, the ART system has been shown to be effective at reducing the mass flux of VOCs off-Property. The second entails monitored natural attenuation (MNA). MNA will further reduce dissolved VOC in groundwater off-Property through natural physical and chemical processes to below groundwater standards at the POE.

6.2.2 ART System VIRP

6.2.2.1 Overview

Since 2012, Rheem has installed a progressive series of eight ART remediation wells to address the mass flux of VOCs off-Property. The wells are aligned from the northwest to the southeast, perpendicular to groundwater flow near the western boundary of the Property (Figure 5). The ART remediation wells combine *in situ* air stripping, air sparging, and soil vapor extraction to perform in-well treatment for VOCs in groundwater, with the VOCs extracted from groundwater (as a gas) captured above ground in granular activated carbon canisters.

The ART wells were installed in three phases starting with pilot testing in 2012, an expanded pilot in 2013 and a full-scale system scheduled to be online in June 2016. The ART pilot test comprised of two 4-inch diameter remediation wells (ART-1 and ART-2) brought online in October 2012. Based on the initial pilot test results, three additional ART remediation wells (ART-3, ART-4, and ART-5) were installed in July 2013 as an expanded pilot. The expanded pilot wells were placed across the same groundwater treatment zone as ART-1 and ART-2. The design of the expanded pilot wells was modified from the initial pilot setup with an increase in well casing diameter (4- to 6-inch diameter) to improve air sparge rate and applied vacuum, and the additional wells were installed approximately 20 ft deeper, extending into competent bedrock. To assess the design and performance of the expanded pilot wells, ART-1 and ART-2 were removed from operation from October 2013 to September 2014, while ART-3, ART-4 and ART-5 were assessed. After this one-year assessment period for ART-3, ART-4 and ART-5, the original pilot ART wells were returned to service, with all five ART remediation wells active from September 2014 to date. The performance of the art system from October 2013 to September 2014 (without ART-1 and ART-

2) to more recent testing (with operation of all 5 ART wells) found no benefit to operation of the original 4-inch pilot wells for the current treatment area (*i.e.* no further reduction in groundwater TCE concentrations).

As of the last assessment event (December 2015), the ART system is reducing the groundwater TCE levels from 86% to 99%. Data from the property line monitoring well that exhibited the highest mass flux of TCE (MW-28) documents a 97% reduction in TCE in comparison to peak historical values that predate the installation of the ART system.

6.2.2.2 February 2016 ART Expansion

In February 2016, a further expansion of the ART remediation system was completed with three additional ART wells installed north of ART-3 (Figure 5). The design of the new ART well was based on ART-3, ART-4 and ART-5, which demonstrated a marked improvement in comparison to ART-1 and ART-2. The boring for each new ART well was advanced with sonic drilling technology to a total depth of 120 ft-bgs to 125 ft-bgs. Each new ART well was completed with 6-inch diameter Schedule 40 PVC well casing spanning the entire borehole, with slotted-screen extending from the base of the boring to approximately 10 to 15 feet below ground surface. Boring logs for the three new ART wells are included in Appendix C.

6.2.2.3 Final ART Strategy

The final ART system configuration is illustrated in Figure 19 and includes the three additional 6-inch diameter ART wells (ART-6, ART-7 and ART-8) installed for the purpose of intercepting a broader cross-section of groundwater along the Rheem property line. To optimize the system treatment zone, ART-1 and ART-2 will be deactivated, and the three new ART wells will be connected to the ART sparge/vacuum extraction system for a total of six active ART wells (the current ART aboveground treatment system has a six well capacity). As provided in Section 2.3, no additional benefit was realized for the current treatment zone by operating ART-1 and ART-2 in addition to ART-3, ART-4 and ART-5. Thus ART-1 and ART-2 are redundant for the current treatment zone and the ART system infrastructure will be better utilized to support the expansion (three new ART wells) northwest of ART-3 to intercept and treat a broader cross-section of groundwater (the ART wells are aligned perpendicular to the dominant groundwater flow direction).

6.2.2.4 ART System Monitoring

The performance of the final ART system will continue to be assessed periodically via sampling of down-gradient monitoring wells. The ART system expansion (ART-6, ART-7 and ART-8) will be assessed with monitoring well clusters MW-41 (A to E) and MW-42 (A to E).

6.2.3 Monitored Natural Attenuation

The installed ART system, including the recent ART expansion, is anticipated to continue reducing the mass of VOCs at the western property boundary. With the source of off-Property VOCs managed through the ART system and the TCE release area bioremediation, Rheem will continue to monitor off-Property conditions to assess for MNA of existing VOCs. MNA is a remedial

technology that relies on a combination of intrinsic physical and chemical processes (*e.g.* sorption, dispersion, volatilization, abiotic degradation and biodegradation) to degrade and dilute chemicals of concern.

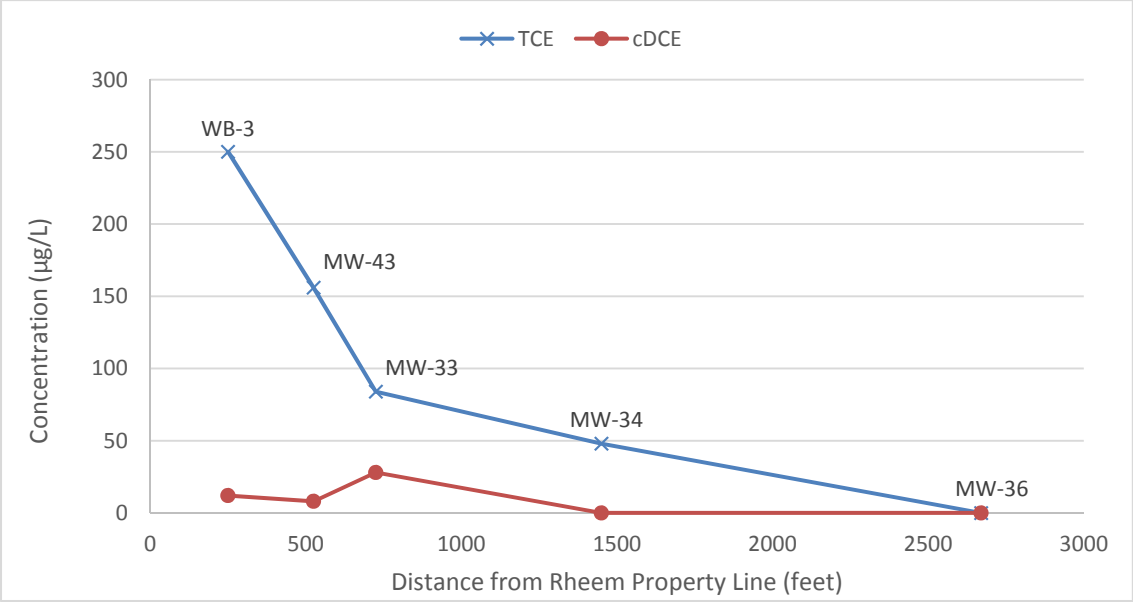
As noted above, MNA is considered an applicable technology if 1) exposure to contaminated ground water above acceptable risk levels is not or will not reasonably occur, 2) if further migration of the plume is not occurring and conditions are improving or will improve as a result of source material remediation and 3) the groundwater plume can be restored to appropriate contaminant levels for current or future beneficial uses, to the extent practicable.

Direct exposure of potential receptors to the groundwater VOC plume is not reasonably expected to occur off-Property, as the area is served by a public water supply and the nearest residential well is greater than 1,000 feet downgradient of the extent of the plume. Off-Property plume delineation and assessment was initiated in 2011 following detection of TCE in WB-3, located approximately 230 feet southwest of the Rheem property line. Following the detection of TCE in WB-3, 10 monitoring wells were installed for the purpose of determining the down-gradient extent and character of the plume. The ten monitoring wells include: MW-33, installed in 2011; MW-34, MW-35 and MW-36 installed in 2012; MW-43, MW-44 and MW-45 installed in 2013; MW-46 and MW-47 installed in 2014; and MW-54 installed in 2016.

TCE is currently reported in four of the ten off-Property wells (MW-33, MW-34, MW-43, and MW-46), and since installation of these wells, the TCE concentrations have remained generally constant (consistent with the CSM).

Natural processes promote reduction in off-Property dissolved phase VOC concentrations, as shown below for off-Property wells as a function of distance from the Property. Near the Rheem property line, a steep drop in concentration is observed (WB-3 to MW-33), followed by a more gradual decline in VOC concentrations to non-detect in MW-36. Actions to further address the off-Property groundwater condition include the Property line ART system, which will provide a barrier to ongoing TCE flux from the Rheem property, and bioremediation, which will reduce the overall mass of TCE migrating from the TCE release area.

Off-Property VOC Concentration Trends



The Off-Property monitoring wells will be sampled semi-annually with low-flow/low-stress methodology and analyzed for VOCs.

6.3 Cost Estimate to Implement the VIRP

The estimated costs for the remedial actions described above are as follows:

Preliminary Cost Estimate

Task	Description	Cost Estimate
1	Project Management	$30,000
2	VRP Progress Reports	$80,000
3	Groundwater Monitoring	$100,000
4	Pump and Treat System O&M	$10,000
5	CSR	$40,000
6	Off-Property Delineation	Completed
7	Property Line Groundwater Remediation (ART System O&M)	$50,000
8	Hydrogeological Study	Completed
9	Risk Assessment/Modeling	$30,000
10	TCE Release Area Soil Remediation (SVE O&M)	$100,000
11	TCE Release Area Groundwater Remediation (Bioremediation)	$1,300,000
12	Vapor Intrusion Assessment/Remediation	$50,000
	Total	$1,790,000

7 PLANNED ACTIVITIES FOR NEXT REPORTING PERIOD

7.1 On-Property Activities

7.1.1 On-Property Groundwater Pump-and-Treat System Operation

Rheem anticipates continuing the operation of the groundwater pump-and-treat system as the near-term remedial technology for on-Property groundwater, until the bioremediation design concept is finalized and implemented.

7.1.2 Property Line ART System Operation

The expanded ART Pilot Test system has shown positive results, including decreasing concentrations of VOCs and an expanding area of influence measured by increased dissolved oxygen and oxidation-reduction potential. During the next reporting period, the three new ART wells will be connected to the equipment compound, and operation of these wells will be initiated.

Prior to startup of the new ART wells, monitoring well nests MW-41 and MW-42 will be sampled using passive diffusion bag methods for VOCs. These wells will be sampled quarterly over the next year to monitor for decreased VOC concentrations over time.

7.1.3 Soil SVE System Operation

The SVE system has extracted a significant amount of TCE from the vadose zone. The system will continue to be operated during the next reporting period.

7.1.4 On-Property Sub-Slab Depressurization System Installation

The new sub-slab depressurization system lines are currently being tested. Once the test results have been evaluated, depressurization equipment will be connected to the new and previously existing lines and the system operations will be initiated.

7.1.5 TCE Release Area Groundwater Bioremediation

EPS is currently finalizing the bioremediation design, including the implementation strategy (i.e. the injection approach) and media injection parameters (i.e. bioremediation media mass and volume per injection location).

7.2 Off-Property Activities

Monitoring wells, including MW-33, MW-34, MW-35, MW-36, MW-43, MW-44, MW-45, MW-46, MW-47, and MW-54 will be sampled during the next reporting period.

8 REFERENCES

Environment Agency, UK. An Illustrated Handbook of DNAPL Transport and Fate in the Subsurface. (2003) Environment Agency R&D Publication 133.

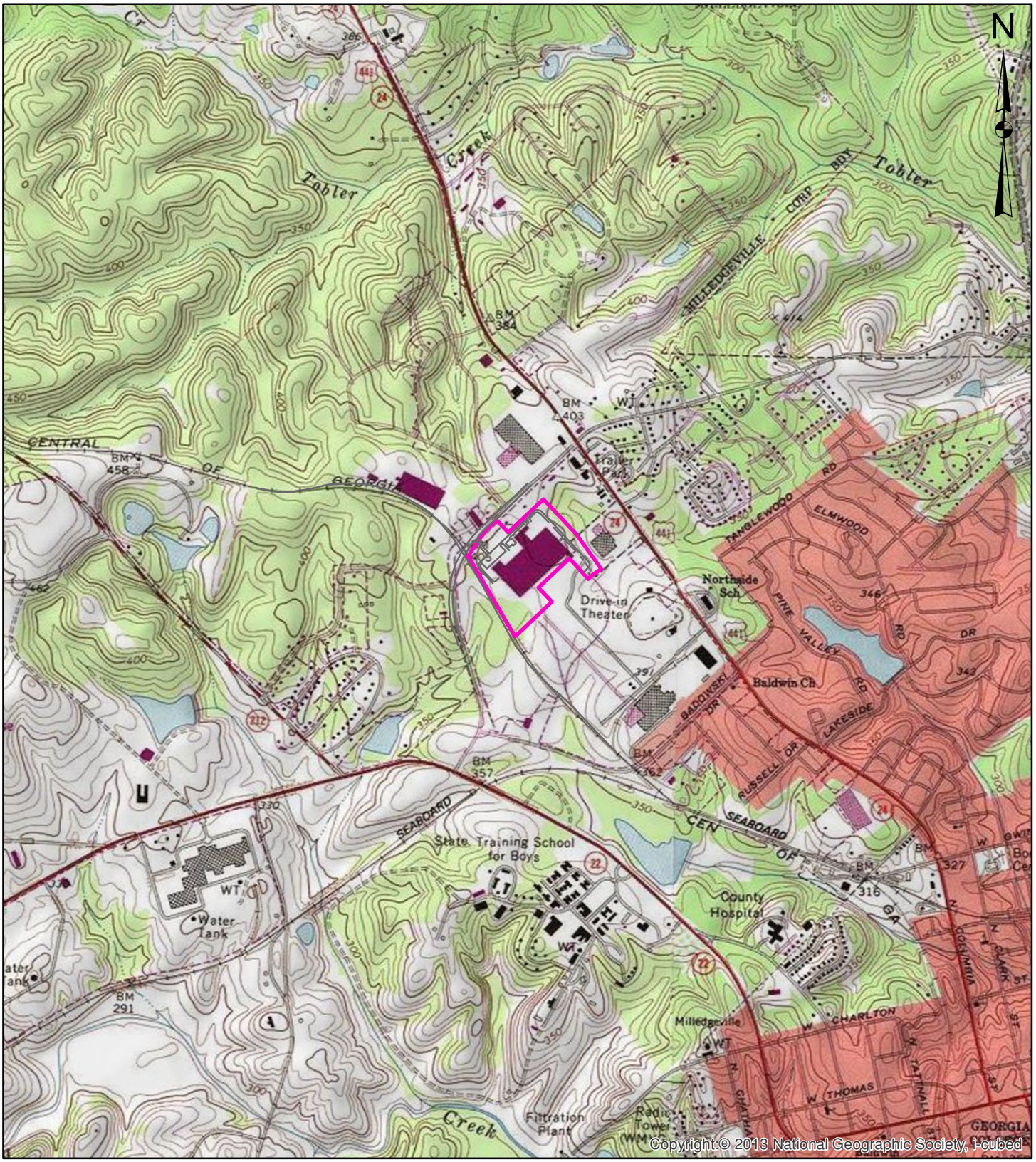
Sowers, G.F, 1963, Engineering Properties of Residual Soils Derived from Igneous and Metamorphic Rocks, Proc. 2nd Panamerican Conference on Soil Mechanics and Foundation Engineering, Sao Paulo, Brazil, 39-62.

Wilson, C. and Martin, R., 1996, Embankment dams in the Piedmont/Blue Ridge Province. Design with Residual Materials: Geotechnical and Construction Conference, ASCE GSP 63, 27-36.

Williams. L.J., W.C. Burton, 2005, Common Types of Water-Bearing Features in Bedrock, Rockdale County, Georgia in Proceedings of the 2005 Georgia Water Resources Conference, held April 25-27, 2005, at the University of Georgia.

Swain, L.A., Mesko, T.O., and Holiday, E.F., 2004, Summary of the Hydrogeology of the Valley and Ridge, Blue Ridge, and Piedmont Physiographic Provinces in Eastern United States, USGS Professional Paper 1422-A.

FIGURES



0 1,000 2,000
Feet

Legend

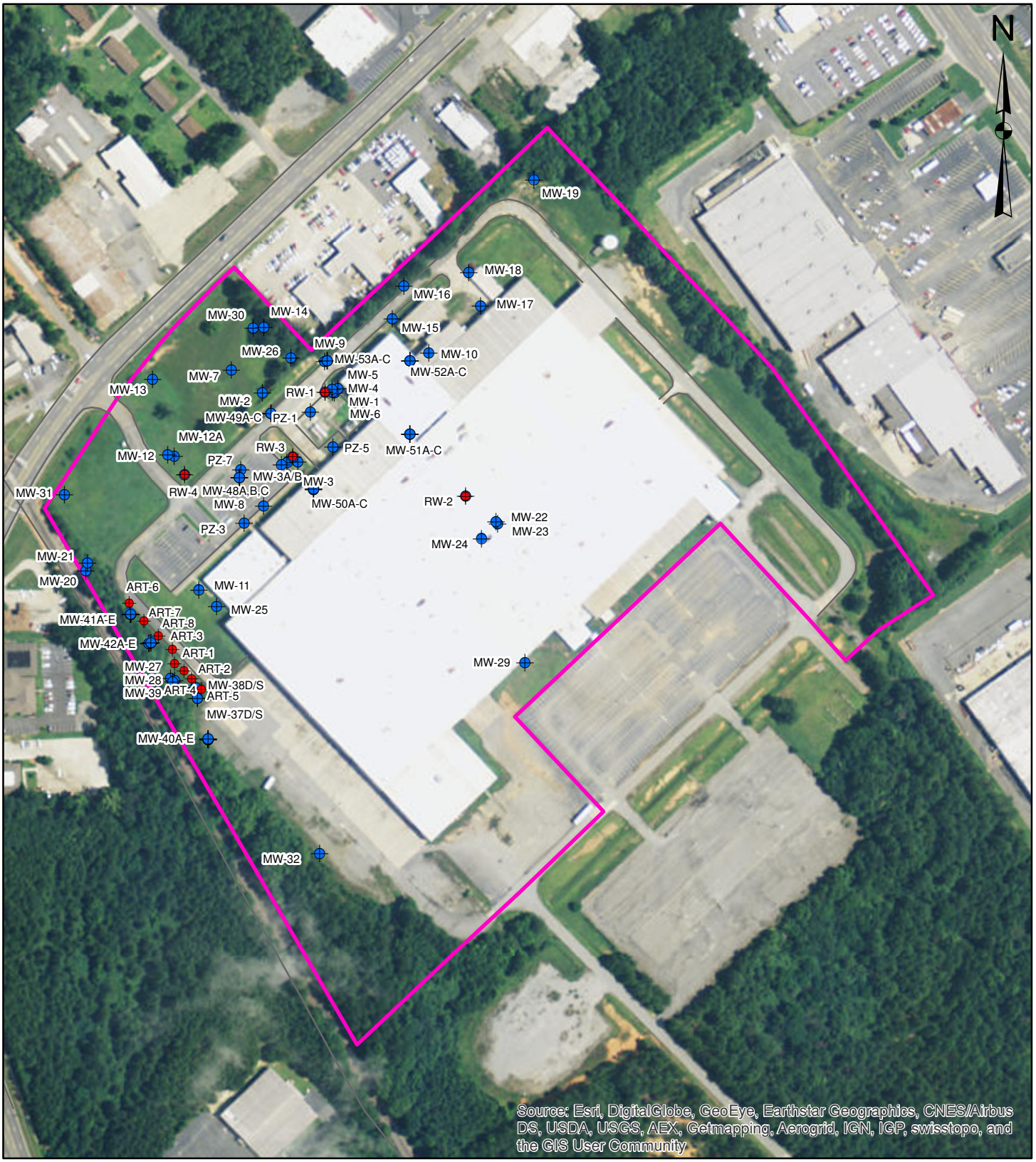
Property Line

Property Vicinity Topographic Map

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.1



0 150 300
Feet

Legend

- Property Line
- Monitoring Well
- Remediation Well

Property Plan

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.2A

0 300 600
Feet

Legend

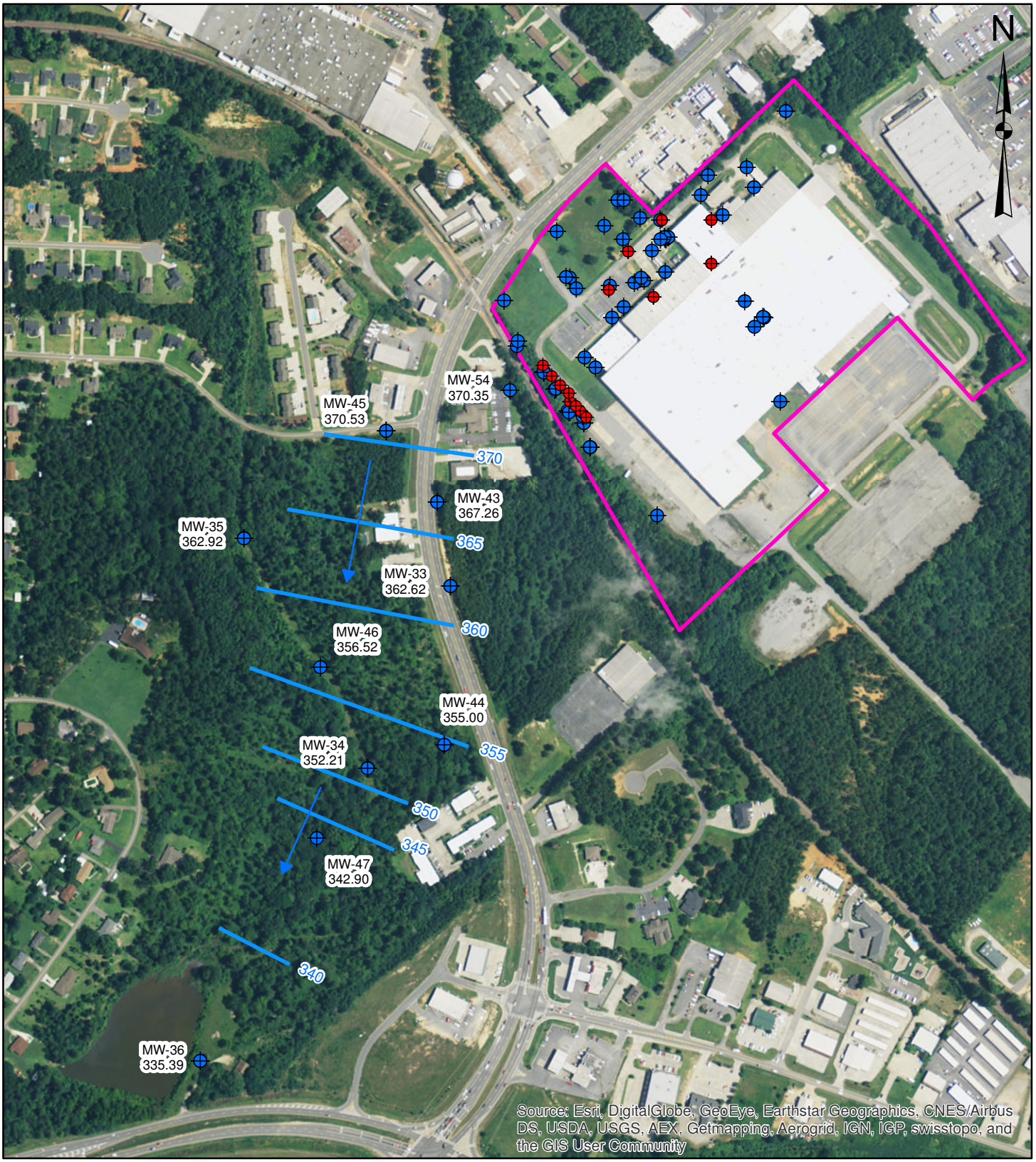
- Property Line
- Monitoring Well
- Remediation Well

Property Vicinity Plan

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.2B



0 250 500
Feet

Legend

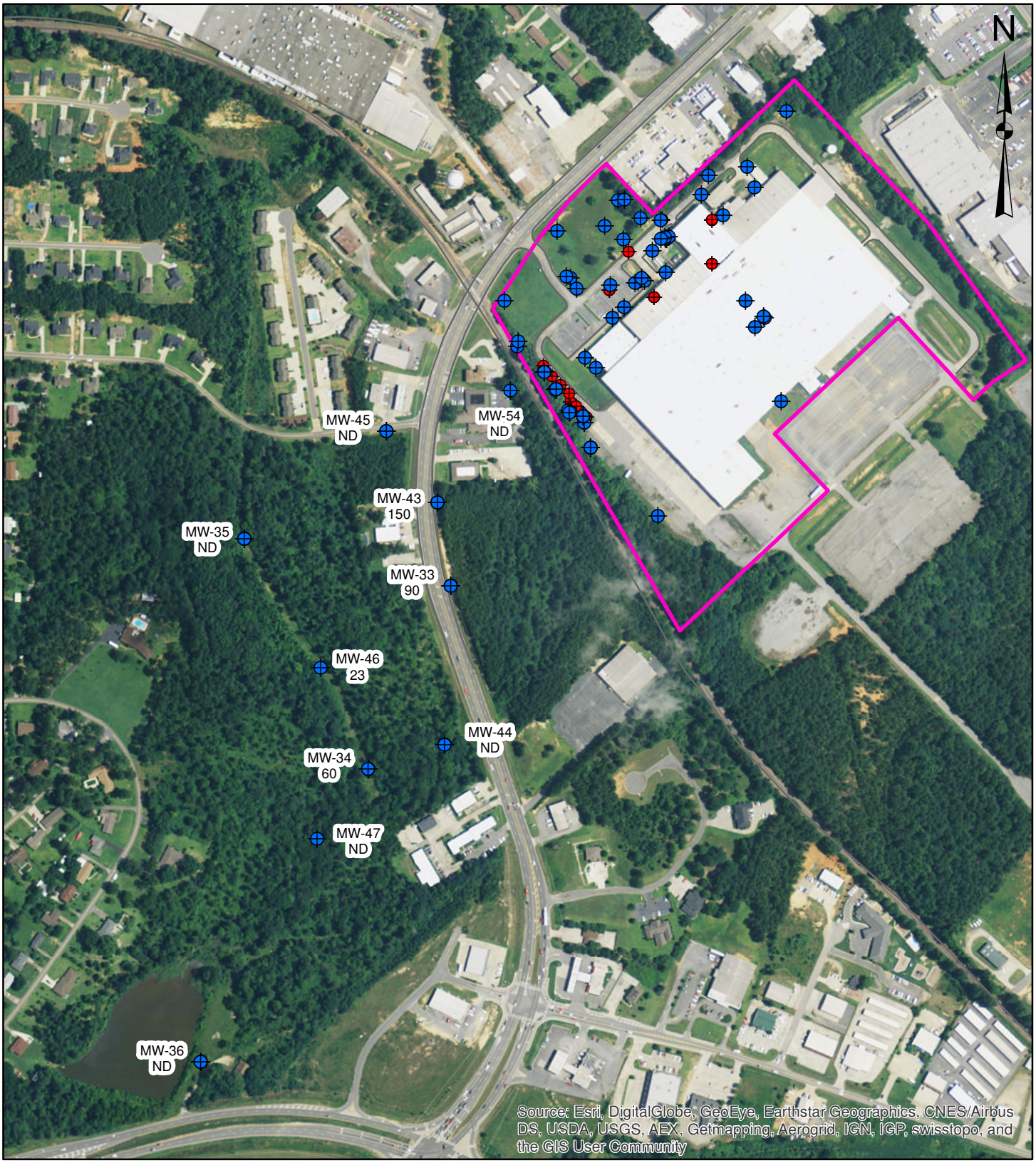
- Property Line
- Monitoring Well
- 334.92 Groundwater Elevation (ft)
- Remediation Well
- 360 Potentiometric Surface Contour
- Groundwater Flow Direction
- NA Not Accessible

Potentiometric Surface Map for Off-Property Wells (April 2016)

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.3



0 250 500
Feet

Legend

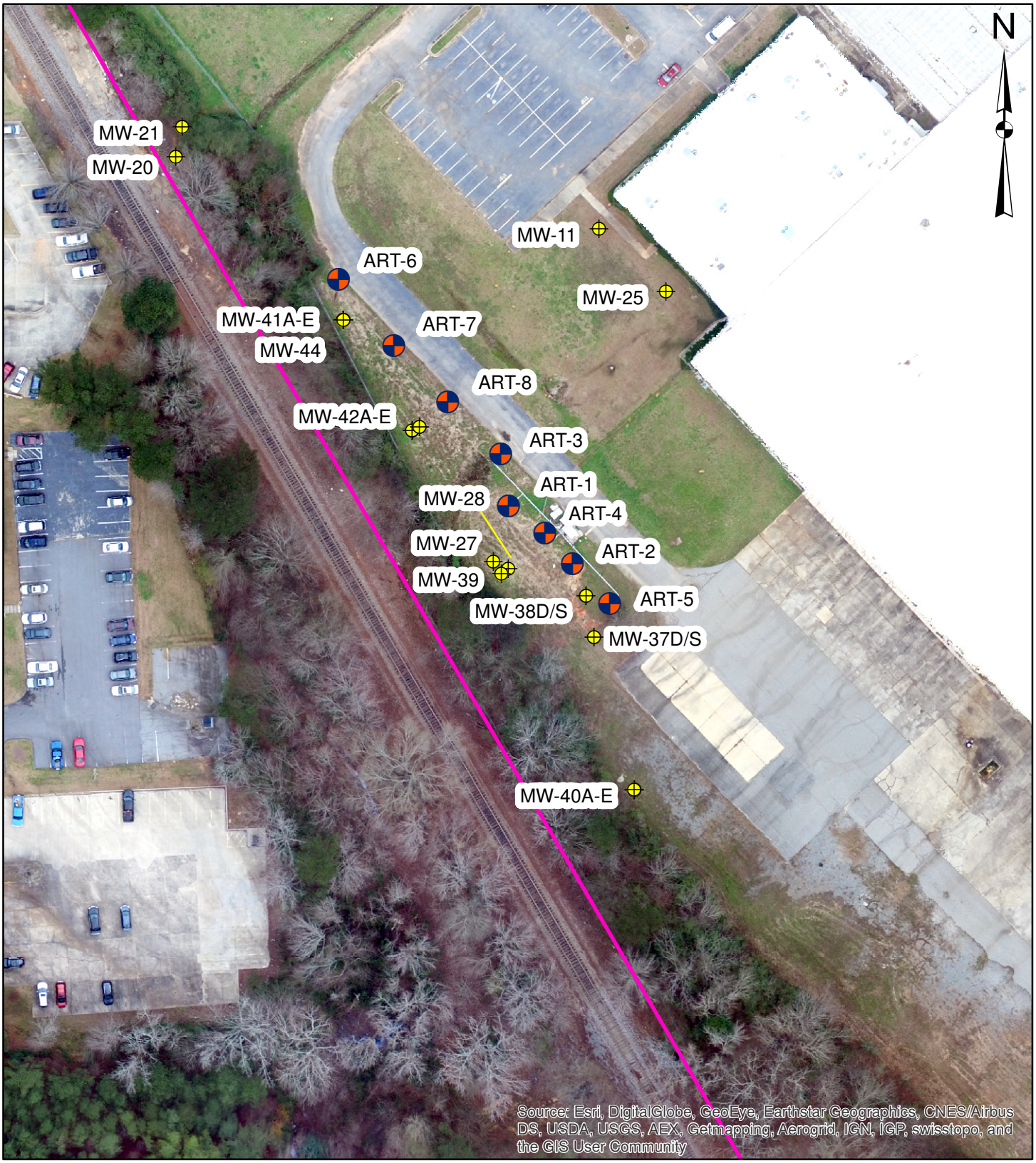
- Property Line
- Monitoring Well
- 57 TCE Concentration (ug/L)
- Remediation Well

Groundwater Sampling Results for Off-Property Wells (April 2016)

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.4



0 40 80
Feet

Legend

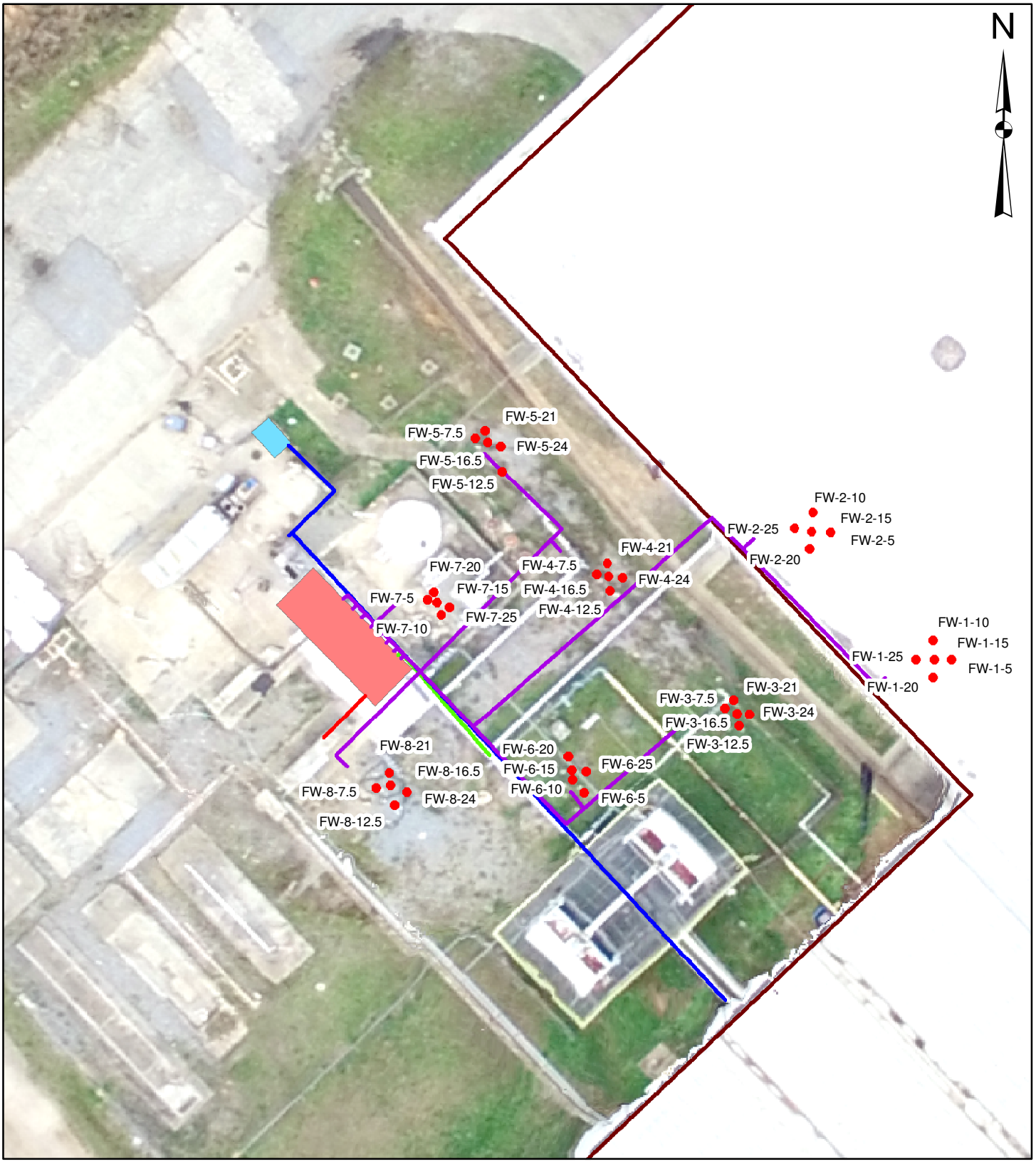
- ART Well Location
- Property Line
- Monitoring Well

Property Line Plan

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.5

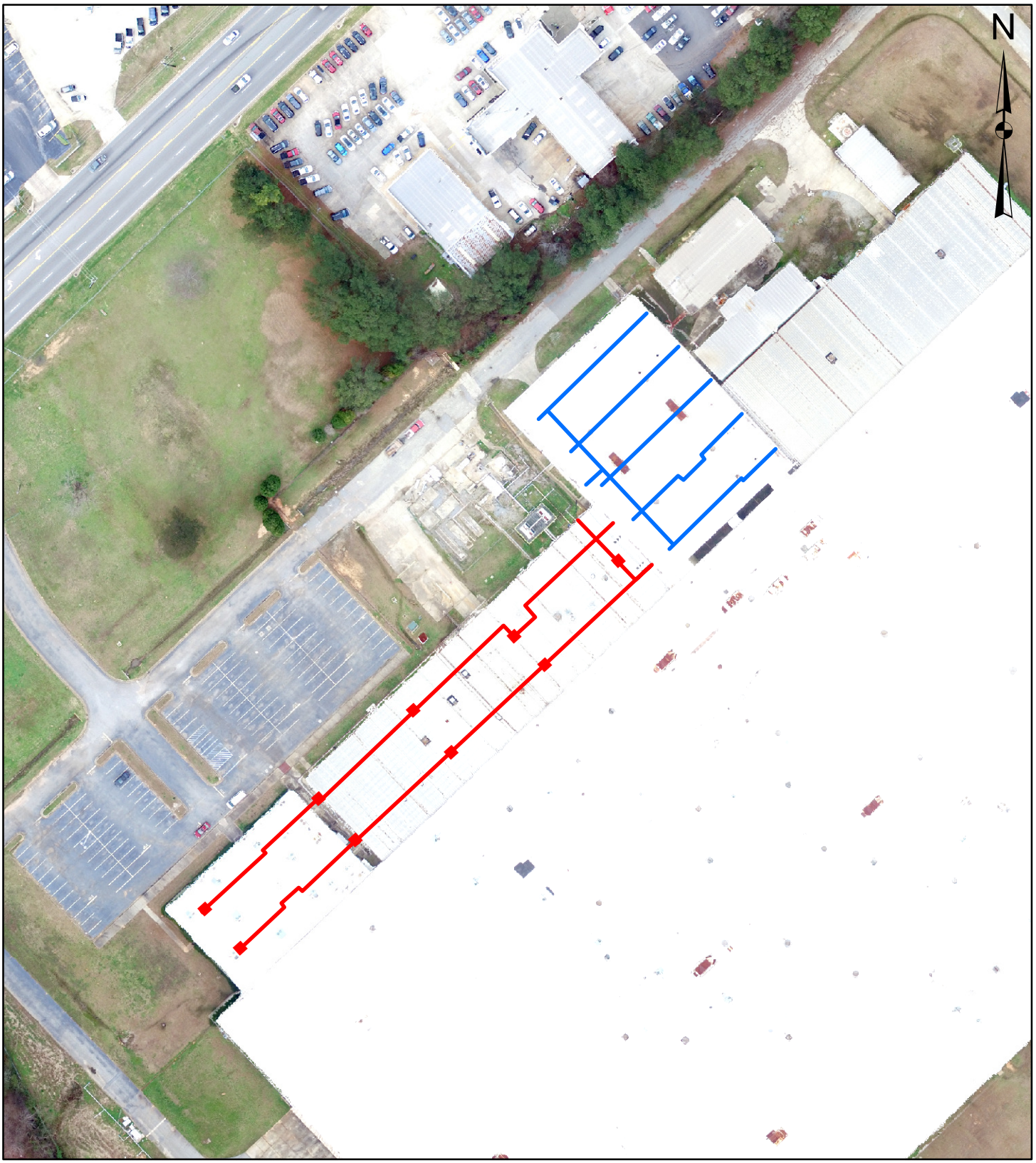


SVE System Layout

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.
G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 6



0 60 120
Feet

Legend

- Sub-Slab Vapor Lines (Phase I)
- Sub-Slab Vapor Lines (Phase II)
- Access Vault

Sub-Slab Depressurization System Layout

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.
G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 7

0 300 600
Feet

Legend

- Property Line
- Monitoring Well
- Remediation Well

Cross Section

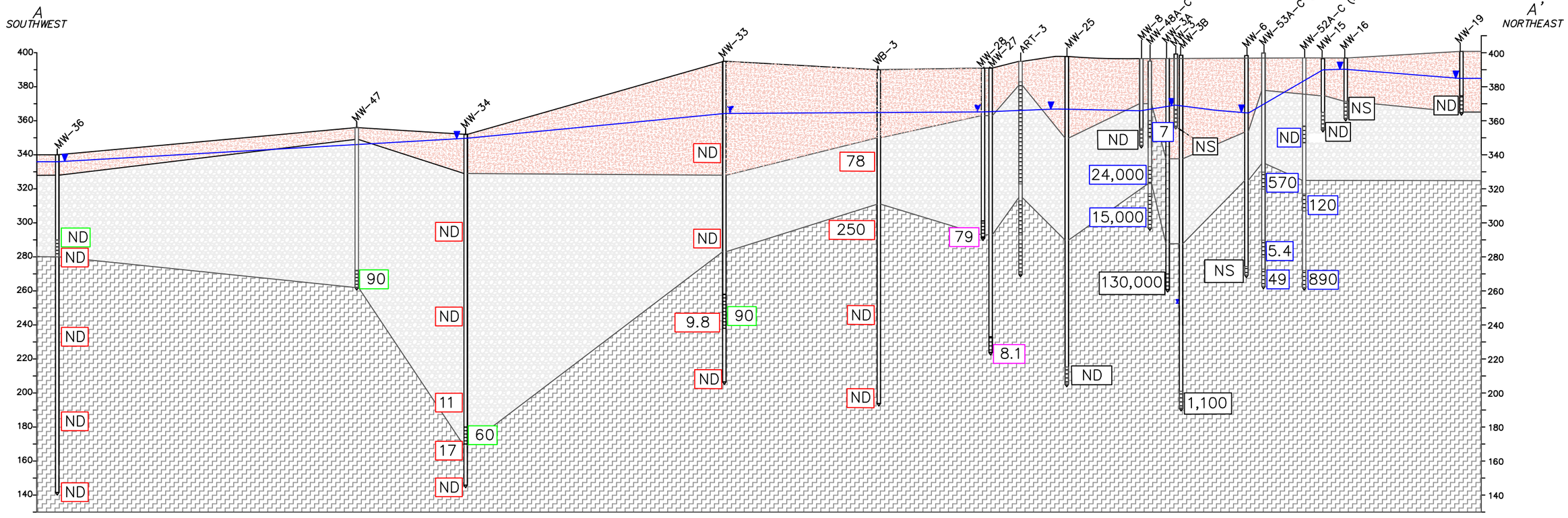
- A - A'
- B - B'

Hydraulic Profile Locations

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.8A



VERT. SCALE (FT) 60 30 0

0 150 300

HORIZ. SCALE (FEET)

LEGEND

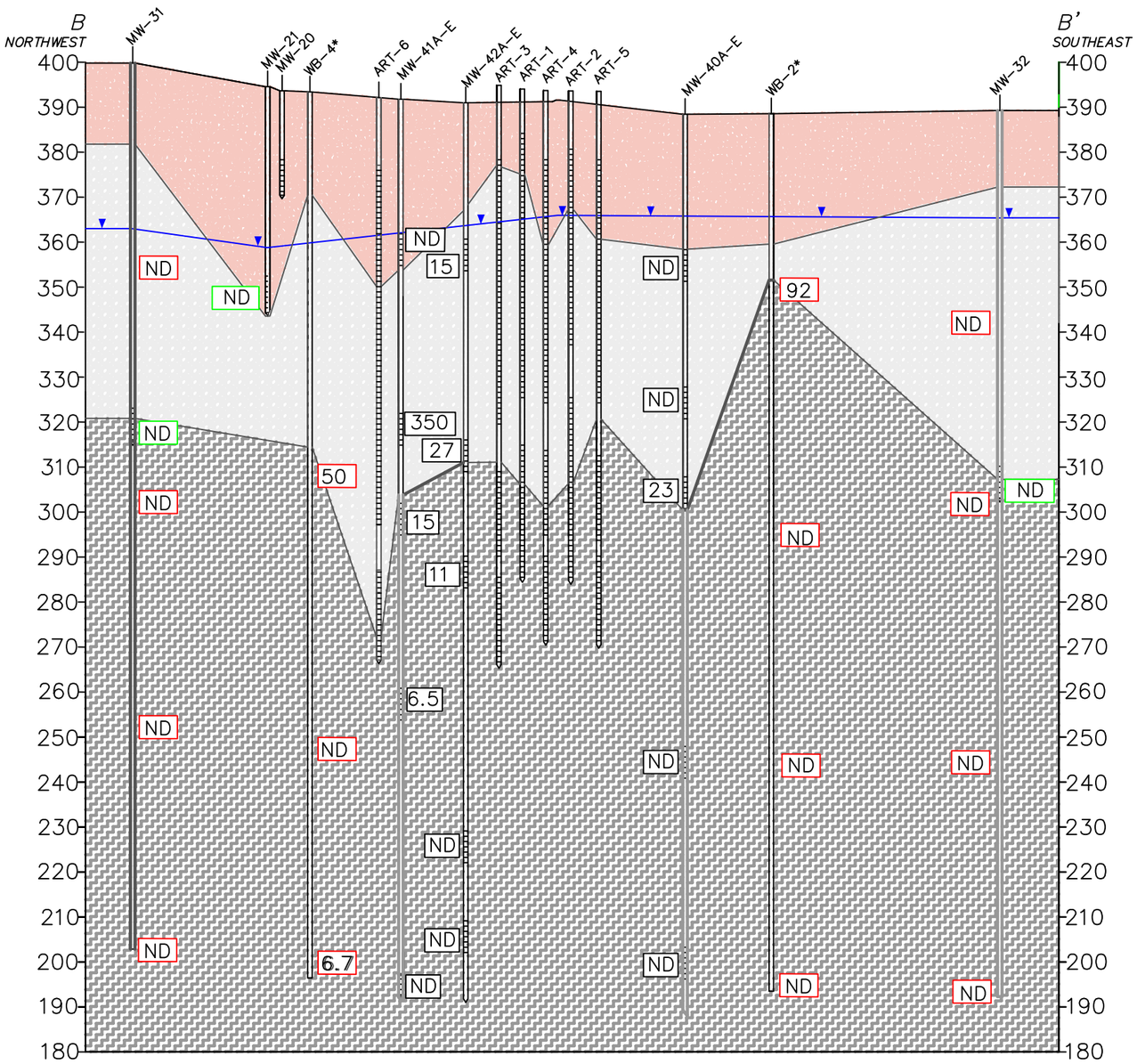
- RESIDUUM
- PARTIALLY WEATHERED ROCK
- BEDROCK
- WATER TABLE ELEVATION JUNE 2013
- Projected — WELL PROJECTED INTO PLANE OF CROSS-SECTION
- SCREENED INTERVAL
- 100 — TRICHLOROETHENE (TCE) CONCENTRATIONS IN GROUNDWATER (ug/L) [April 2015]
- 100 — TRICHLOROETHENE (TCE) CONCENTRATIONS IN GROUNDWATER (ug/L) [April 2016]
- 100 — TRICHLOROETHENE (TCE) CONCENTRATIONS IN GROUNDWATER (ug/L) [December 2015]
- 100 — TRICHLOROETHENE (TCE) CONCENTRATIONS IN GROUNDWATER (ug/L) [JUNE 2013]
- NS; ND — NOT SAMPLED; NON-DETECT
- 0 — DISCRETE INTERVAL (PACKER SAMPLE TESTING) TCE CONCENTRATION (SAMPLE DATES BELOW)
  WB-3 = JUNE 2011
  MW-33 = OCT. 2011
  MW-34 = JULY 2012
  MW-36 = SEPT. 2012

EPS

Hydrogeologic Profile A - A'

Rheem Manufacturing Company
Milledgeville, GA

Figure No. 8B



LEGEND

- RESIDUUM
- PARTIALLY WEATHERED ROCK
- BEDROCK
- WATER TABLE ELEVATION June 2013
- SCREENED INTERVAL

78 — TRICHLOROETHENE (TCE) CONCENTRATIONS IN GROUNDWATER (ug/L) [OCTOBER 2014]

78 — TRICHLOROETHENE (TCE) CONCENTRATIONS IN GROUNDWATER (ug/L) [JUNE 2013]

78 — TRICHLOROETHENE (TCE) CONCENTRATIONS IN GROUNDWATER (ug/L) [SEPTEMBER 2014]

78 — TCE CONCENTRATIONS IN GROUNDWATER (ug/L) (JULY 2011) DURING PACKER TESTING

NS;ND — NOT SAMPLED;NON-DETECT

* = NO WELL WAS SET IN BORINGS WB-2 AND WB-4

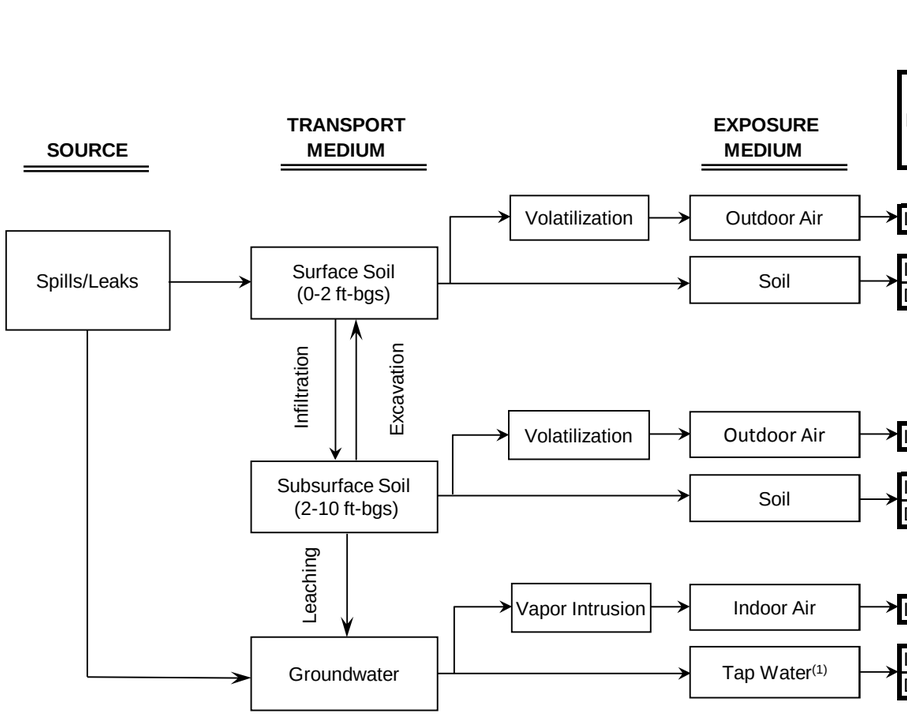
EPS

Hydrogeologic Profile B - B'

Rheem Manufacturing Company
Milledgeville, GA

Figure No. 8C

Figure 9
Potential Receptors and Exposure Pathways
Rheem Manufacturing Company
Milledgeville, Georgia



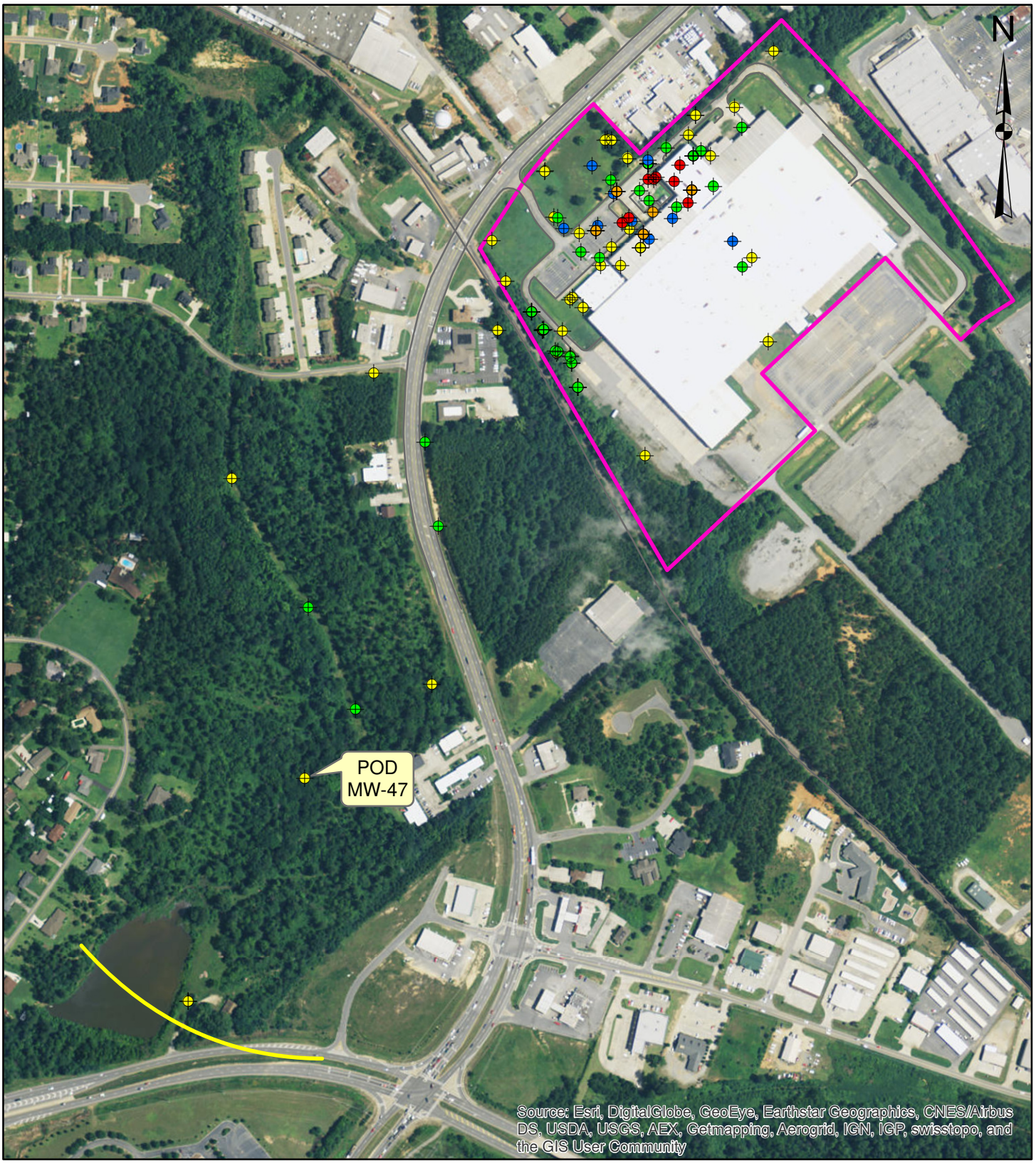
	On-Site						Off-Site		
	Current / Future			Future			Current/Future		
EXPOSURE ROUTE	Site Worker	Groundskeeper	Ecological	Construction Worker	Trespasser	Resident	Resident	Commercial Worker	Ecological
Inhalation	●	●	❖	●	●	●	--	--	--
Ingestion	●	●	❖	●	●	●	--	--	--
Dermal Contact	●	●	❖	●	●	●	--	--	--
Inhalation	●	--	--	●	--	--	--	--	--
Ingestion	--	--	--	●	--	--	--	--	--
Dermal Contact	--	--	--	●	--	--	--	--	--
Inhalation	--	--	--	❖	--	❖	❖	❖	--
Ingestion	--	--	--	--	--	--	❖	❖	--
Dermal Contact	--	--	--	--	--	--	❖	❖	--

Legend

-- = Incomplete exposure pathway
❖ = Potentially complete exposure pathway, but with minimal exposure potential
● = Potentially complete exposure pathway

Footnotes

(1) This pathway is contengent on installation and use of private wells.



0 250 500
Feet

Legend

Property Line

Hypothetical Point of Exposure
1,000 ft downgradient of plume

TCE Conc. (mg/L)

- Non-Detect
- < 1
- 1 - 10
- 10 - 100
- > 100

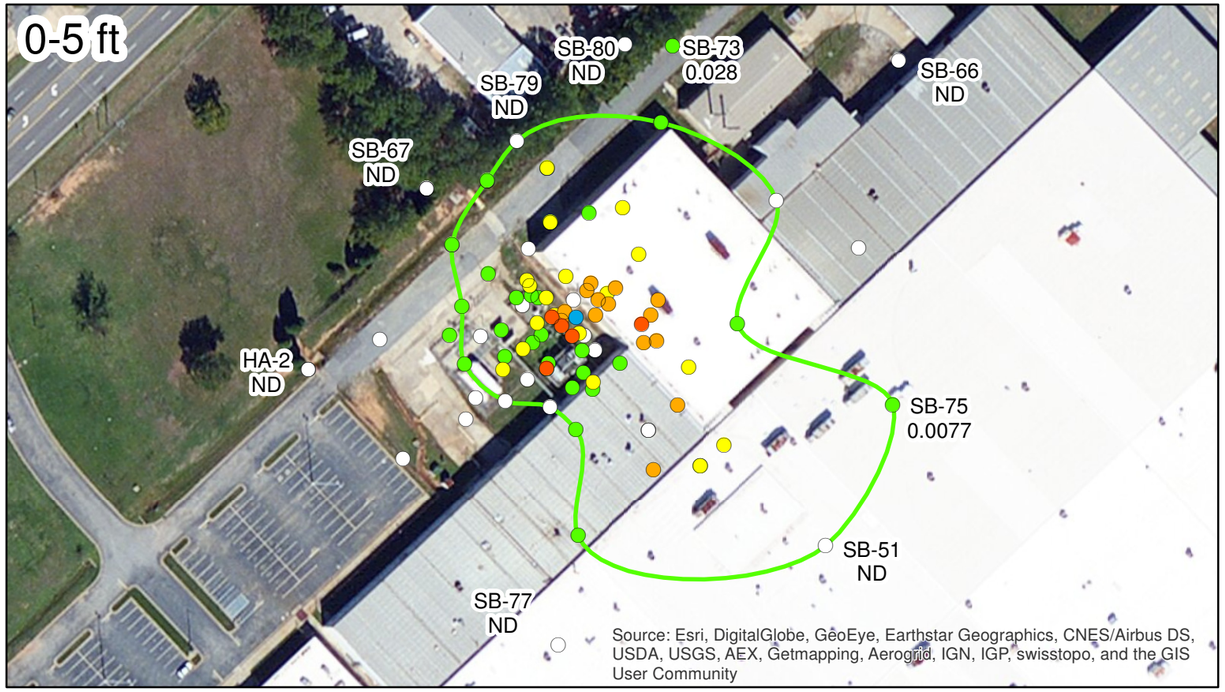
Note: TCE results are from samples collected between 2010 and 2016.

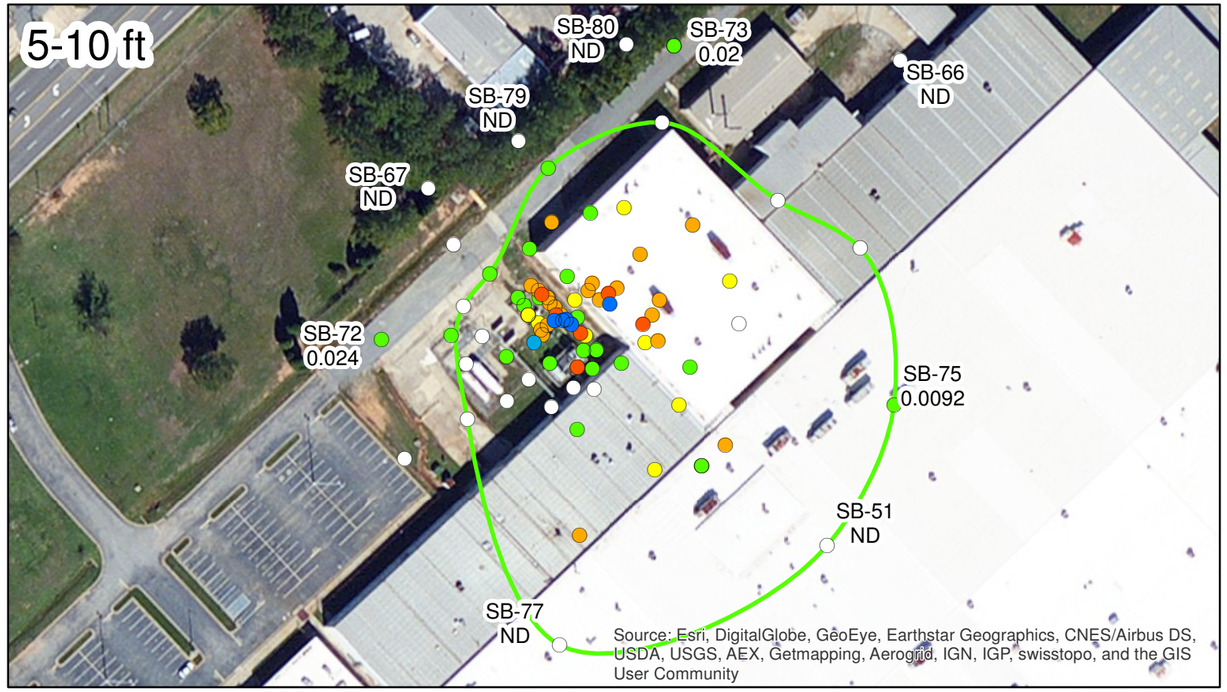
Groundwater Point of Demonstration (POD)

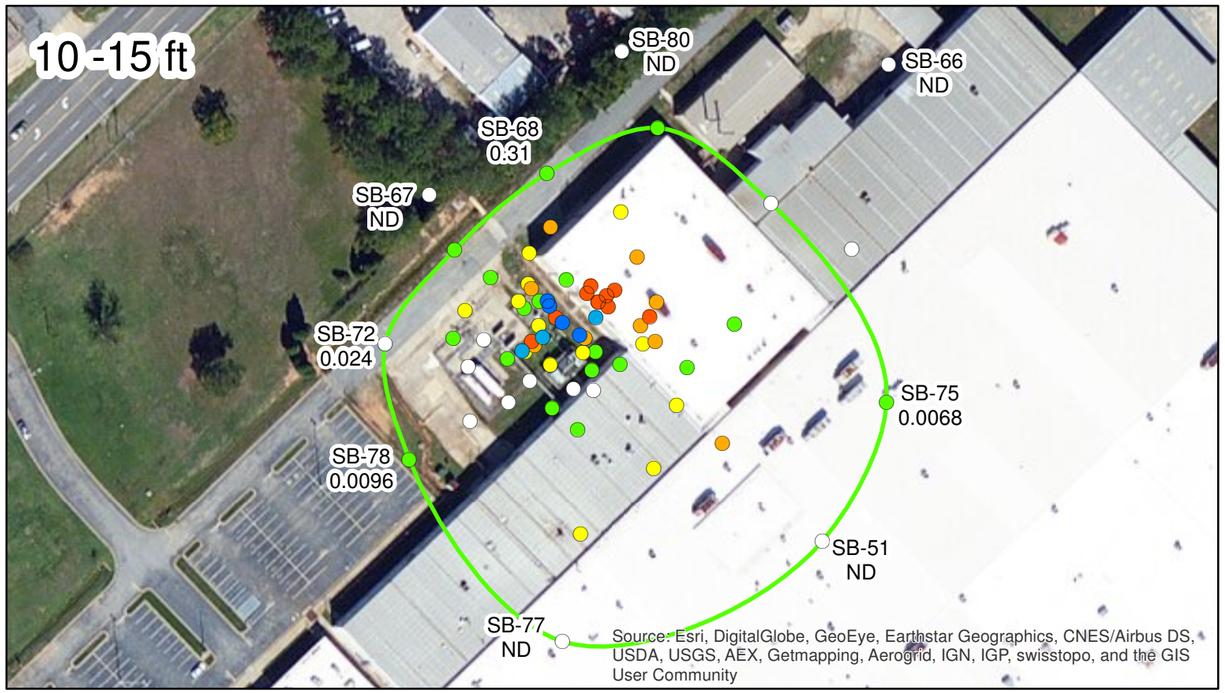
Rheem Manufacturing Company
Milledgeville, Georgia

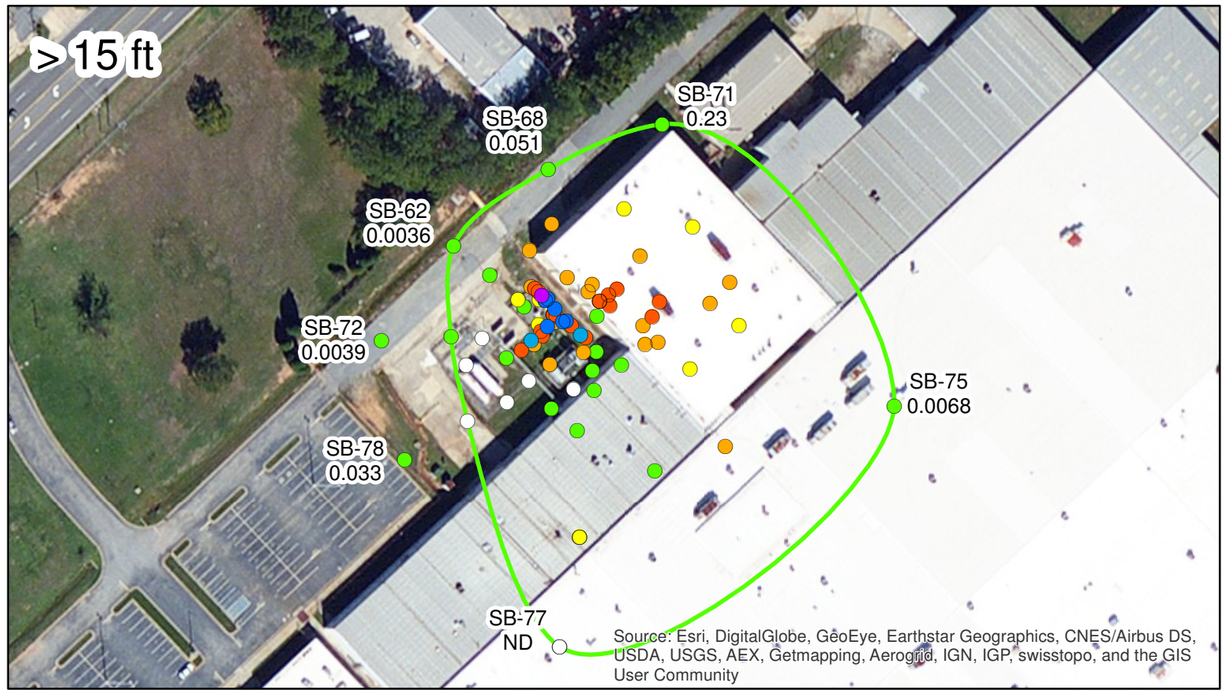
Environmental Planning Specialists, Inc.

Figure No.10









0 65 130
Feet

TCE (mg/kg)

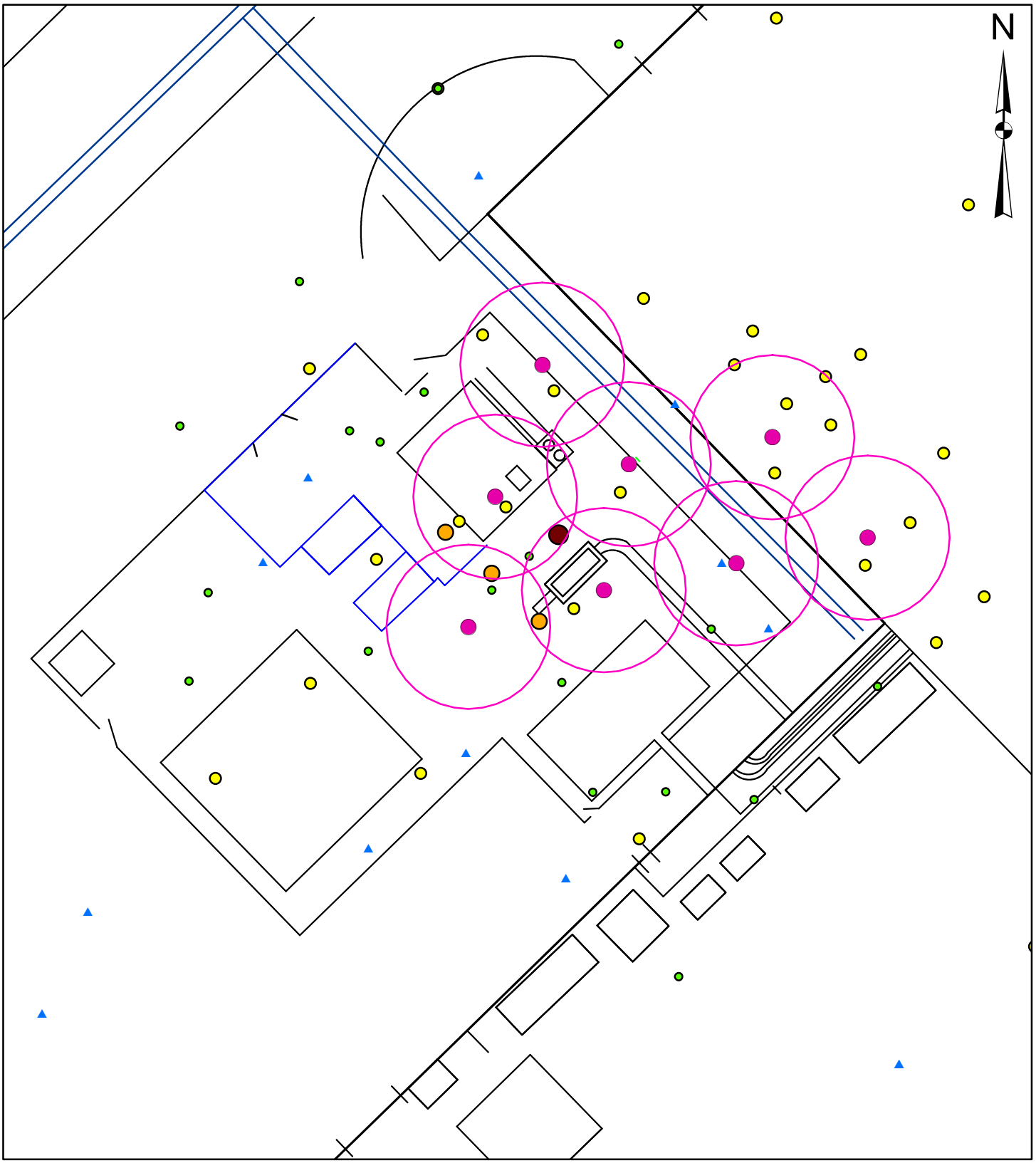
- Non-detect
- < RRS (0.5 mg/kg)
- < 10 x RRS
- < 100 x RRS
- < 1,000 x RRS
- < 10,000 x RRS
- < 100,000 x RRS
- > 100,000 x RRS
- Delineation Contour

Soil Delineation

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.
G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 11



0 12.5 25
Feet

Legend

TCE Concentration (mg/kg)

- ND
- ND - 0.5 (<Type 2 RRS)
- 0.5 - 100
- 100 - 500
- > 500

- Site Features
- Water Line
- Radius of Influence
- Frac Wells

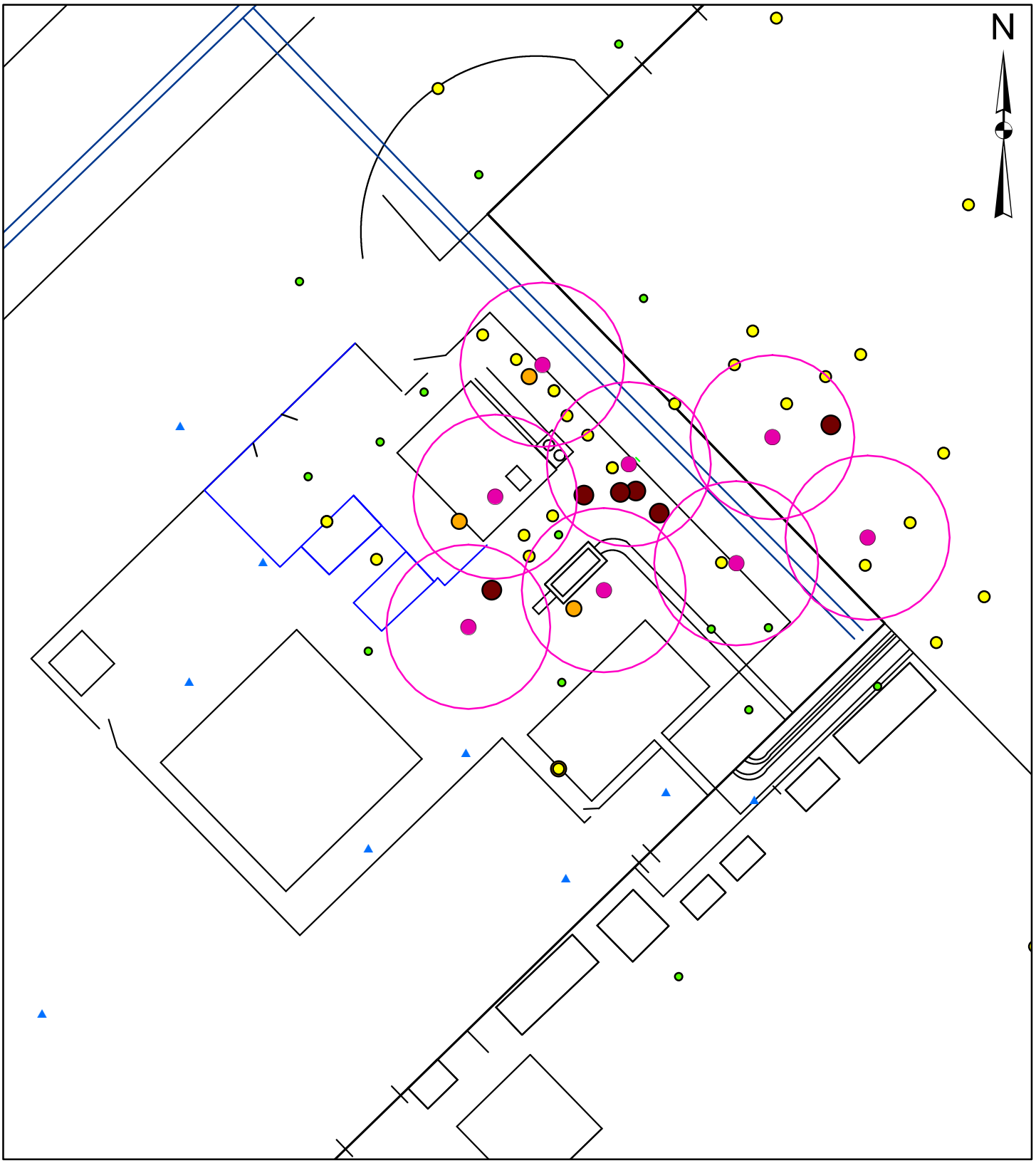
SVE System Layout and Pre-Remediation Soil TCE Concentration (< 5 ft)

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 12A



0 12.5 25
Feet

Legend

TCE Concentration (mg/kg)

- ND
- ND - 0.5 (<Type 2 RRS)
- 0.5 - 100
- 100 - 500
- > 500

- Site Features
- Water Line
- Radius of Influence
- Frac Wells

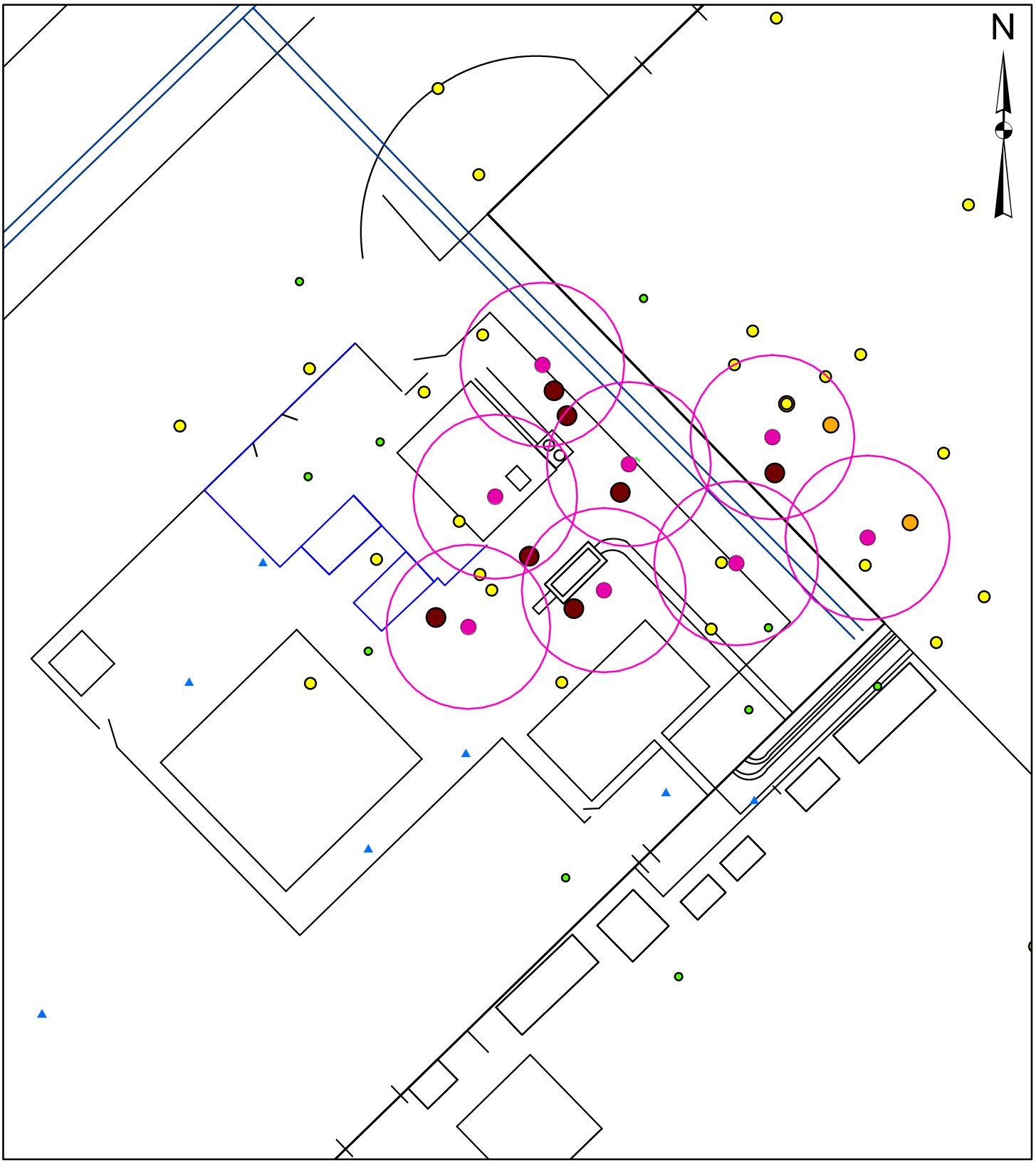
SVE System Layout and Pre-Remediation Soil TCE Concentration (5 - 10 ft)

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 12B



0 12.5 25
Feet

Legend

TCE Concentration (mg/kg)

- ND
- ND - 0.5 (<Type 2 RRS)
- 0.5 - 100
- 100 - 500
- > 500

- Site Features
- Water Line
- Radius of Influence
- Frac Wells

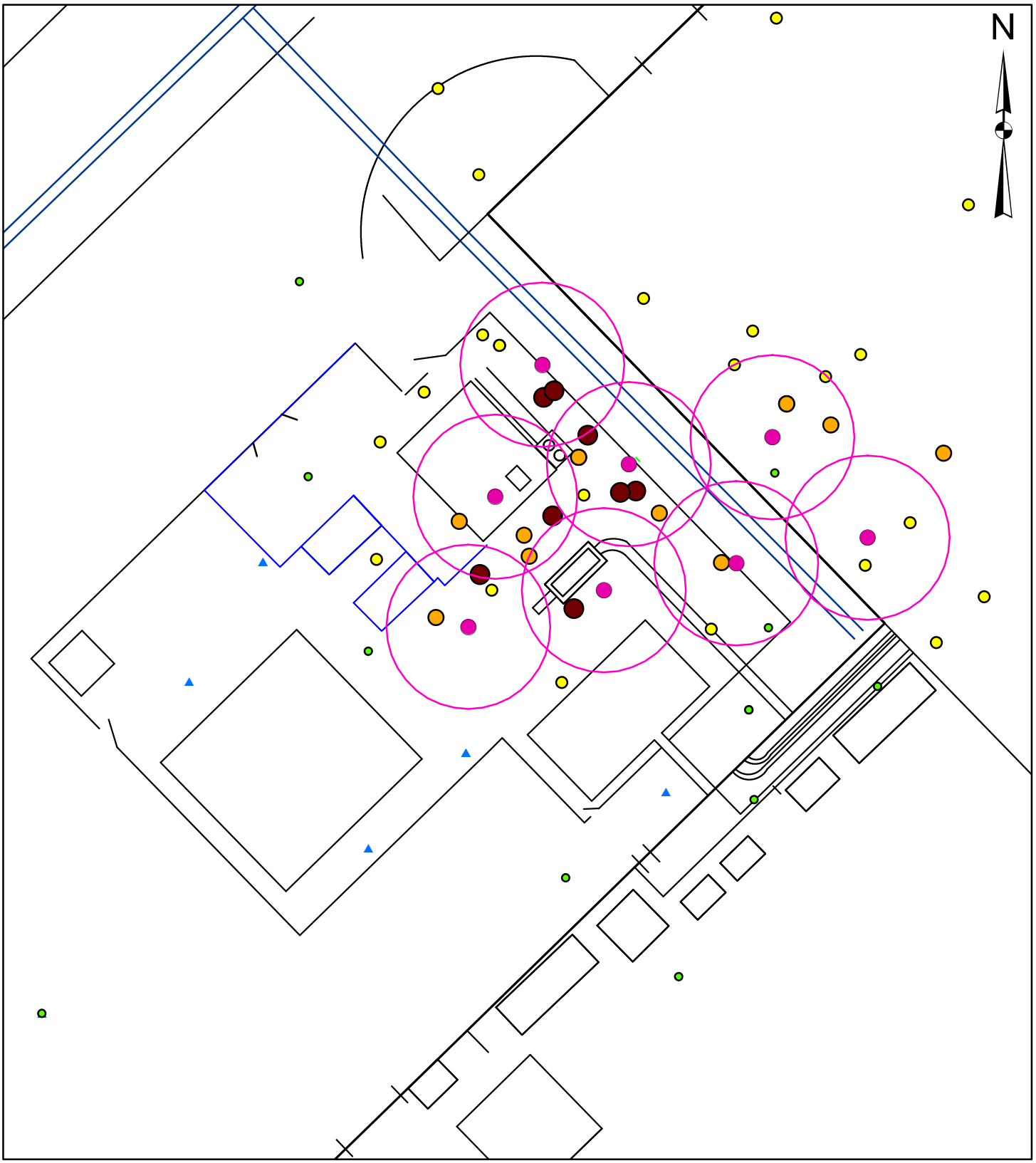
SVE System Layout and Pre-Remediation Soil TCE Concentration (10 - 15 ft)

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 12C



0 12.5 25
Feet

Legend

TCE Concentration (mg/kg)

- ND
- ND - 0.5 (<Type 2 RRS)
- 0.5 - 100
- 100 - 500
- > 500

- Site Features
- Water Line
- Radius of Influence
- Frac Wells

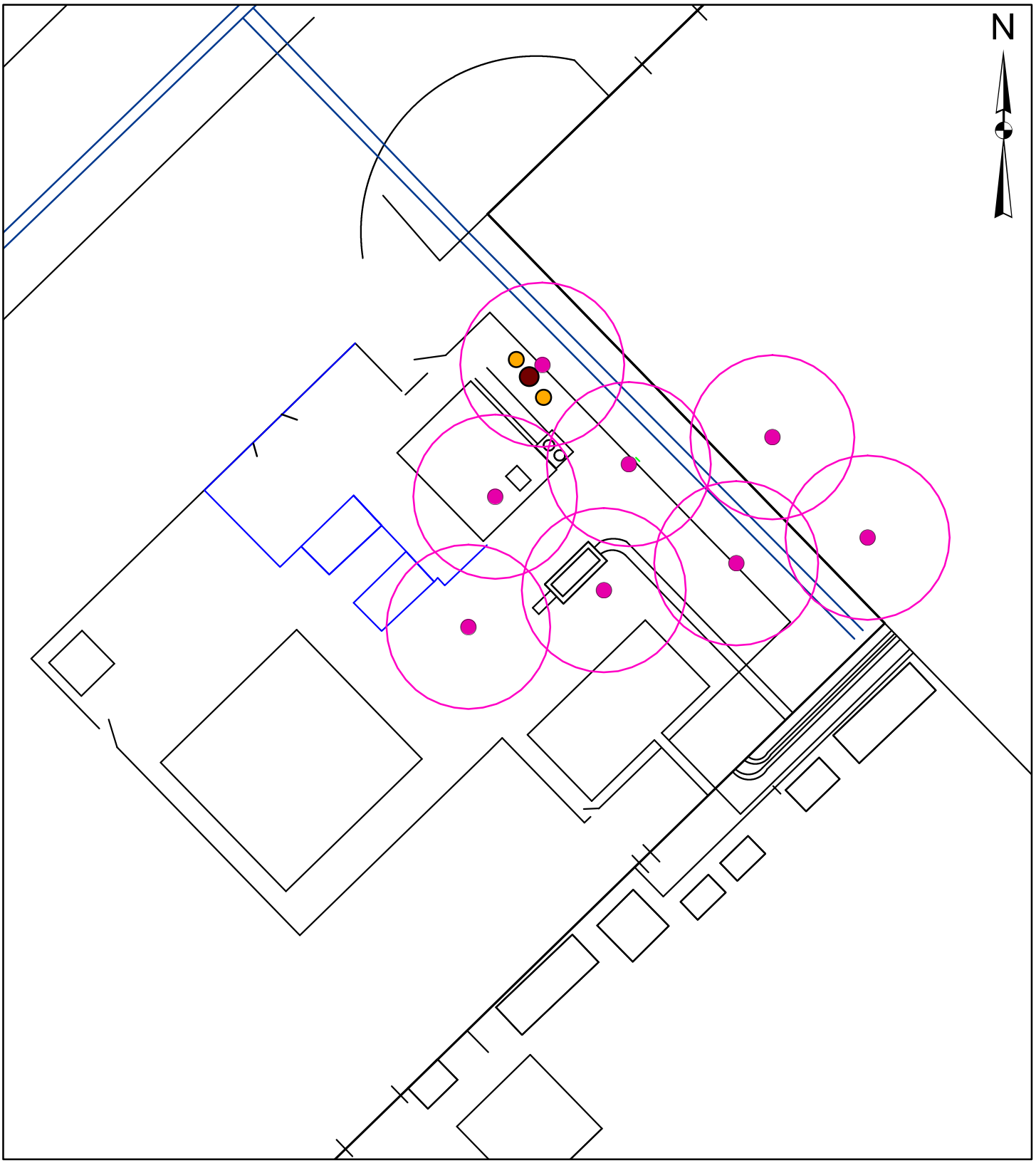
SVE System Layout and Pre-Remediation Soil TCE Concentration (15 - 20 ft)

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 12D



0 12.5 25
Feet

Legend

TCE Concentration (mg/kg)

- ND
- ND - 0.5 (<Type 2 RRS)
- 0.5 - 100
- 100 - 500
- > 500

- Site Features
- Water Line
- Radius of Influence
- Frac Wells

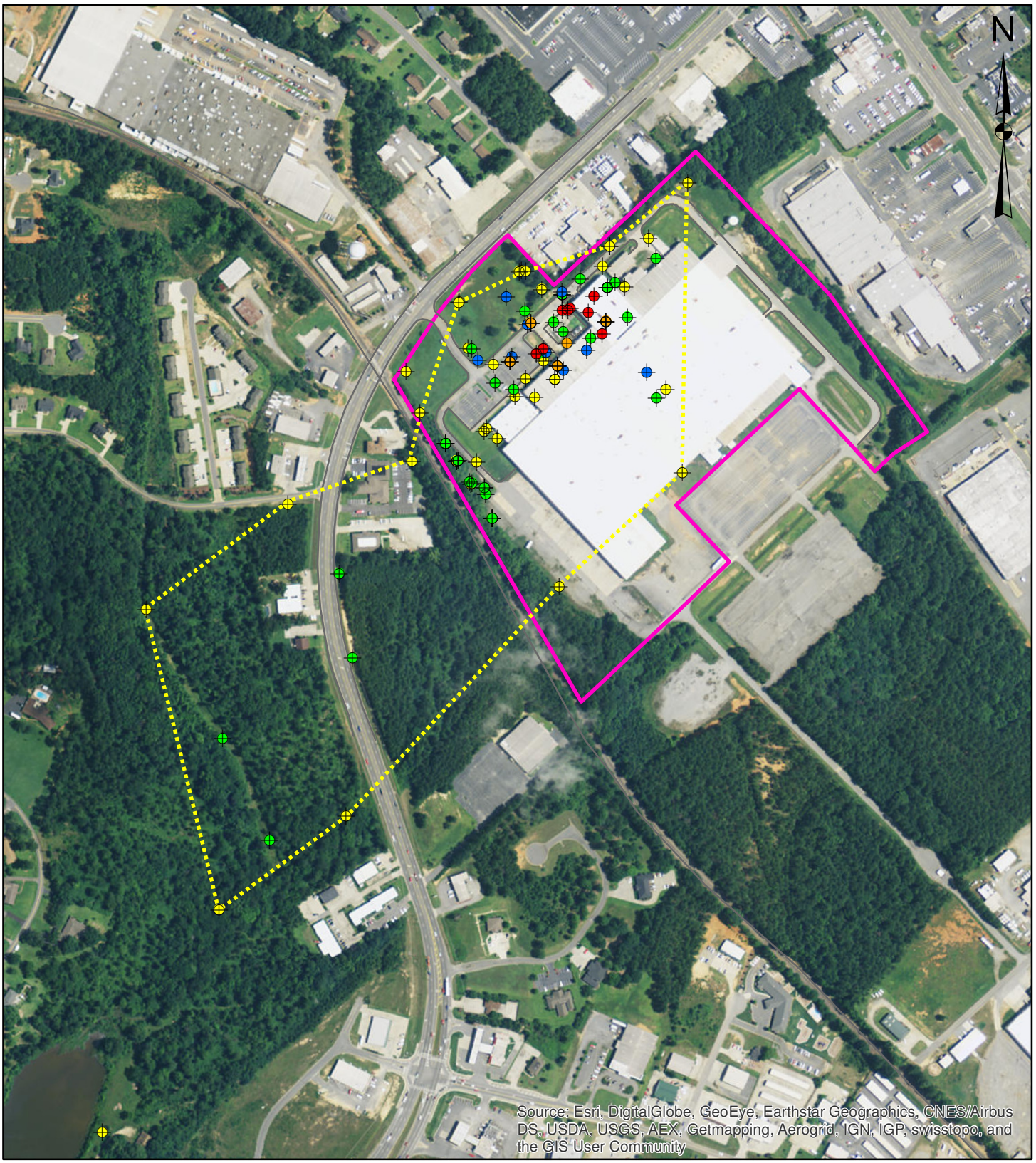
SVE System Layout and Pre-Remediation Soil TCE Concentration (> 20 ft)

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 12E



0 250 500
Feet

Legend

Property Line

Non-Detect Boundary

TCE Conc. (mg/L)

- Non-Detect
- < 1
- 1 - 10
- 10 - 100
- > 100

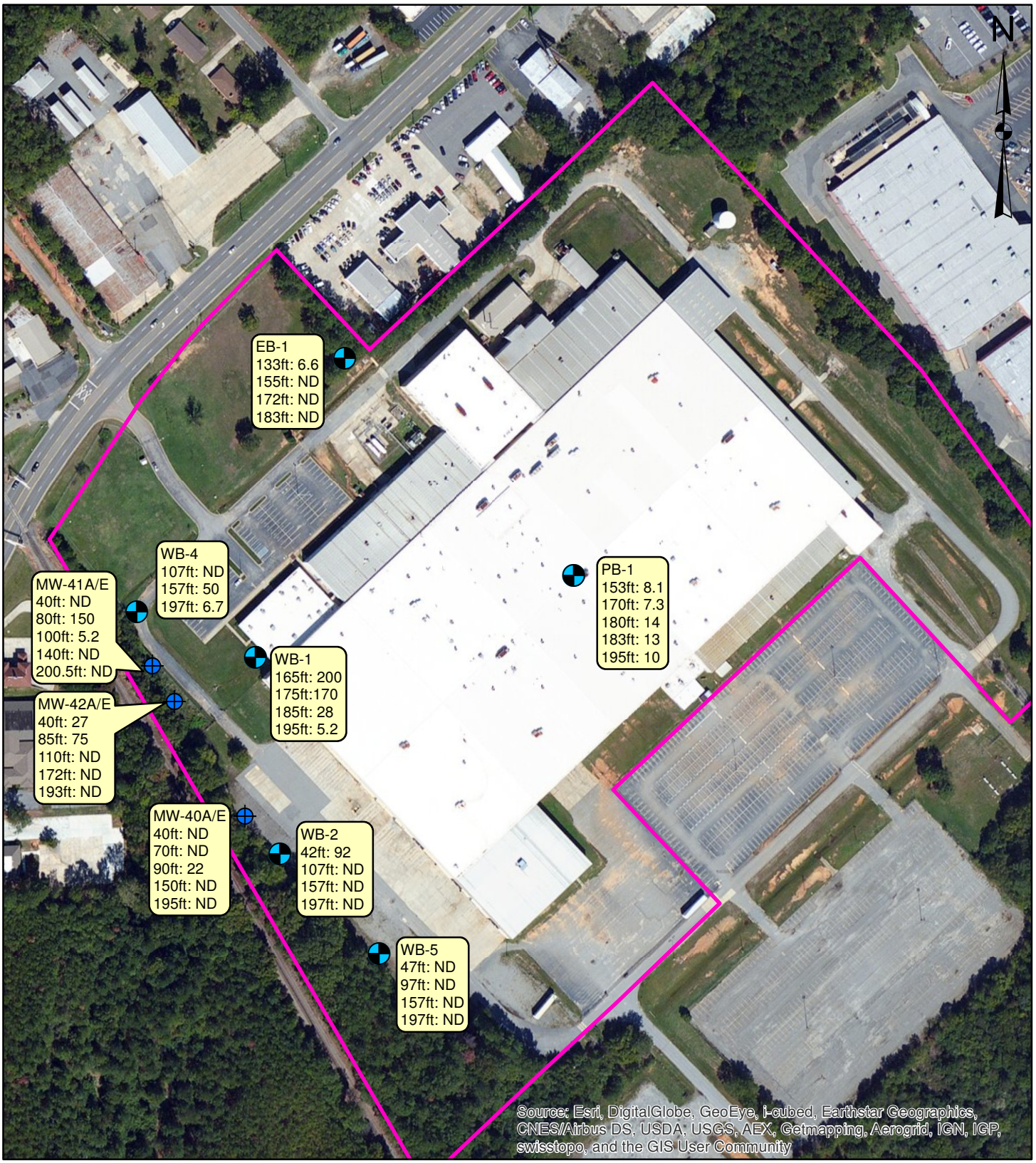
Note: TCE results are from samples collected between 2010 and 2016.

Horizontal Groundwater Delineation

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.13



0 125 250
Feet

Note: TCE concentration are from samples collected 2001 to 2016.

Legend

Property Line

Packer Testing

Monitoring Well Nest

MW/Boring Location
Sample Depth, ft: TCE µg/L

Vertical Groundwater Delineation On-Property

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.14A

0 300 600
Feet

Note: TCE concentration are from samples collected 2001 to 2016.

Legend

Property Line

Packer Testing

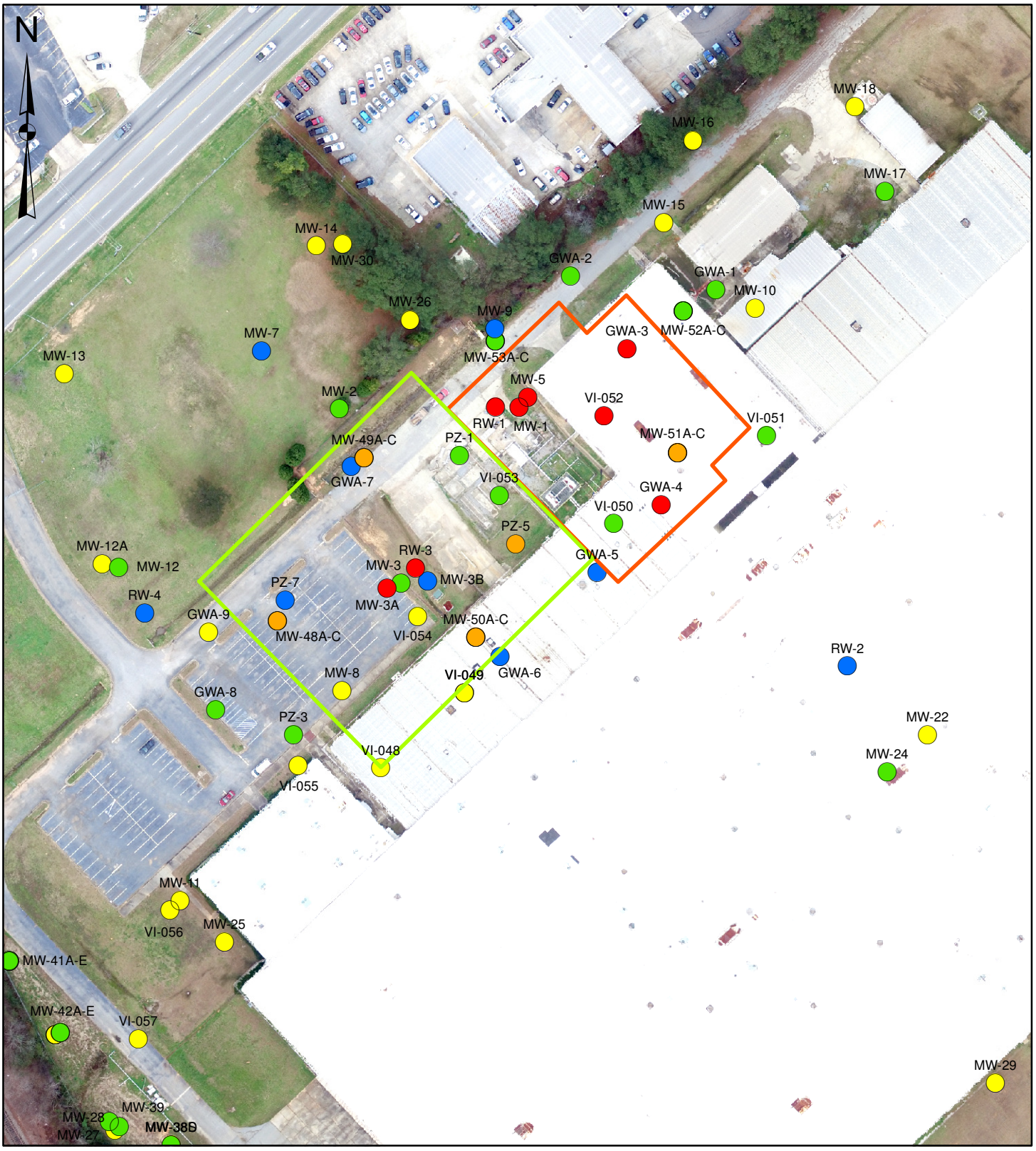
MW/Boring Location
Sample Depth, ft: TCE µg/L

Vertical Groundwater Delineation Off-Property

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.14B



0 60 120
Feet

TCE (mg/L)

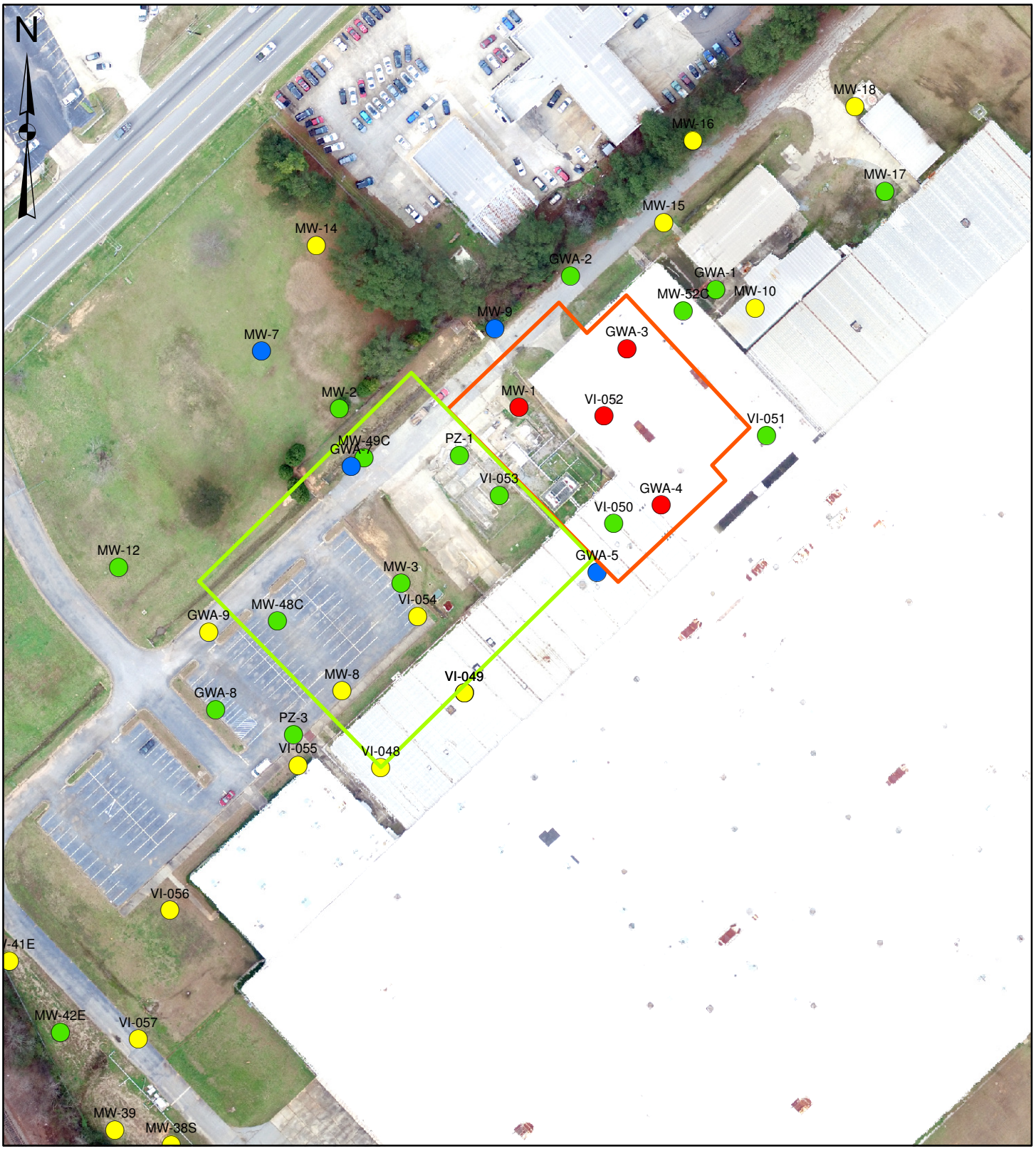
- Non-detect
- < 1
- 1 - 10
- 10 - 100
- > 100

Release Area Treatment Zones

- Release Area Zone
- Plume Zone

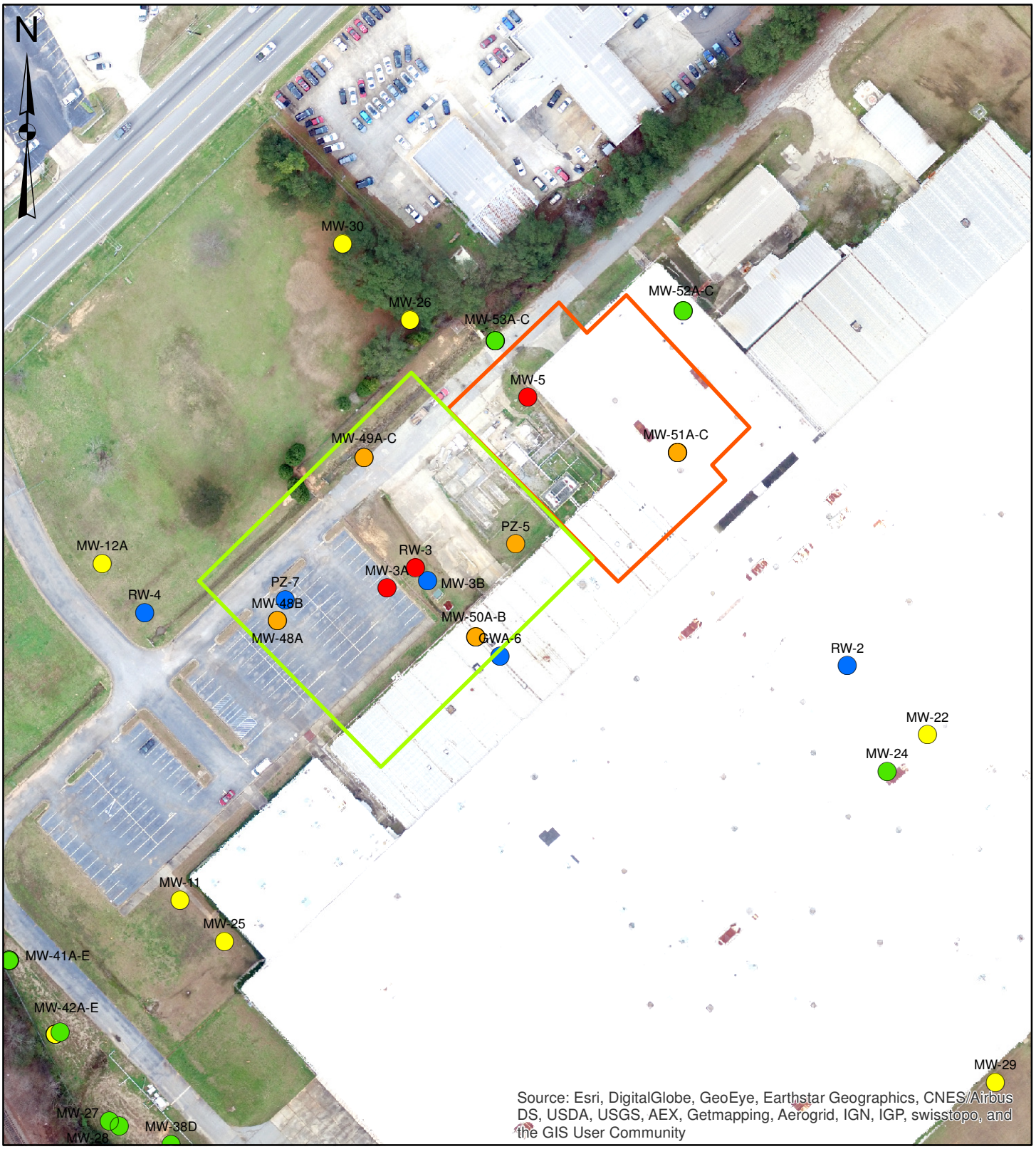
VOC Release
Area Groundwater
Remediation Treatment Zones
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 15



Shallow Groundwater TCE:
< 50 ft Deep, 2010-15
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 16A



0 60 120
Feet

TCE (mg/L)

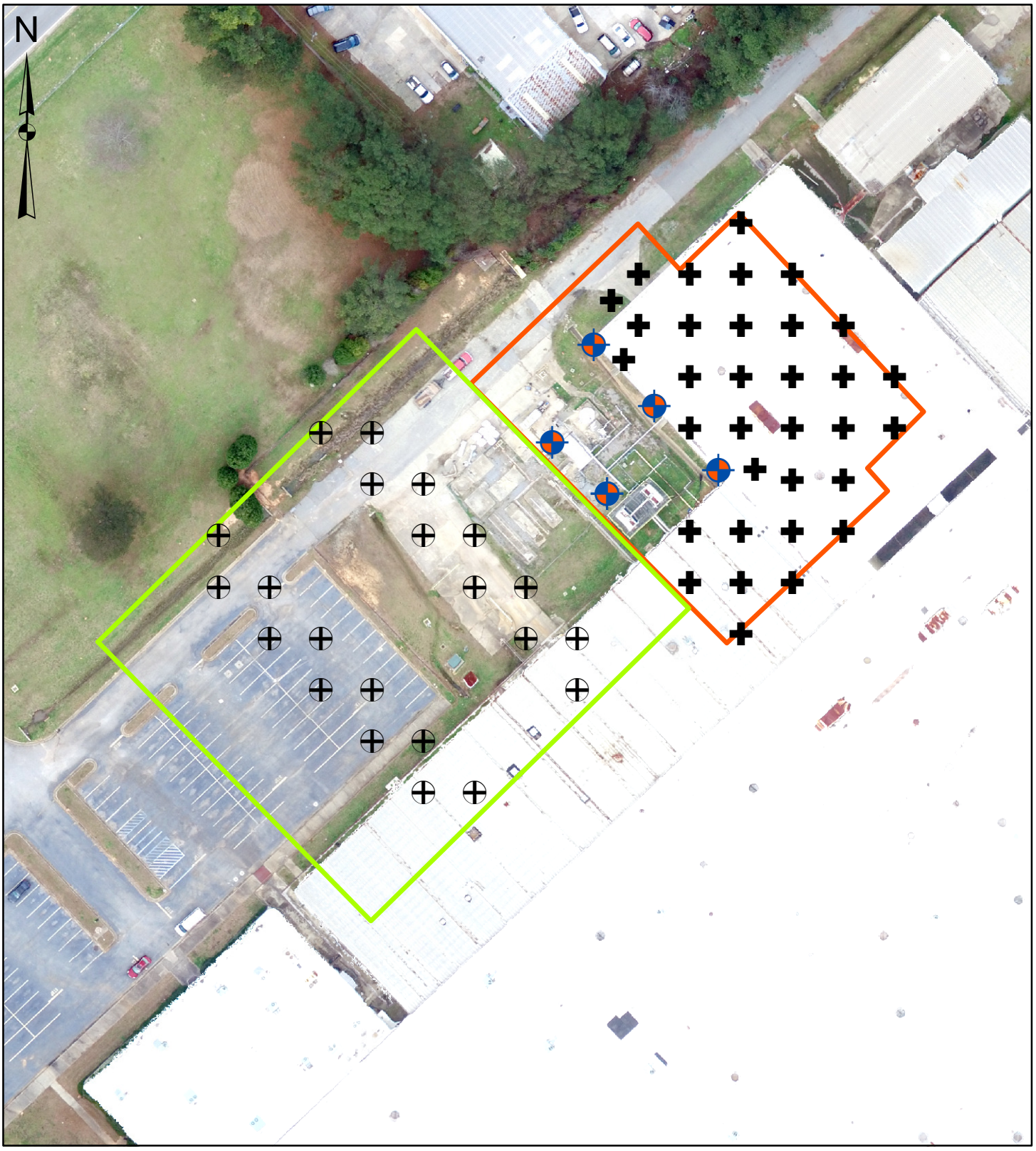
- Non-detect
- < 1
- 1 - 10
- 10 - 100
- > 100

Release Area Treatment Zones

- Release Area Zone
- Plume Zone

Deep Groundwater TCE:
> 50 ft Deep, 2010-15
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 16B



0 40 80
Feet

Implemeamation Phase

- Phase I: Injection Well
- Phase II: Direct Push Point
- Phase III: Direct Push Point

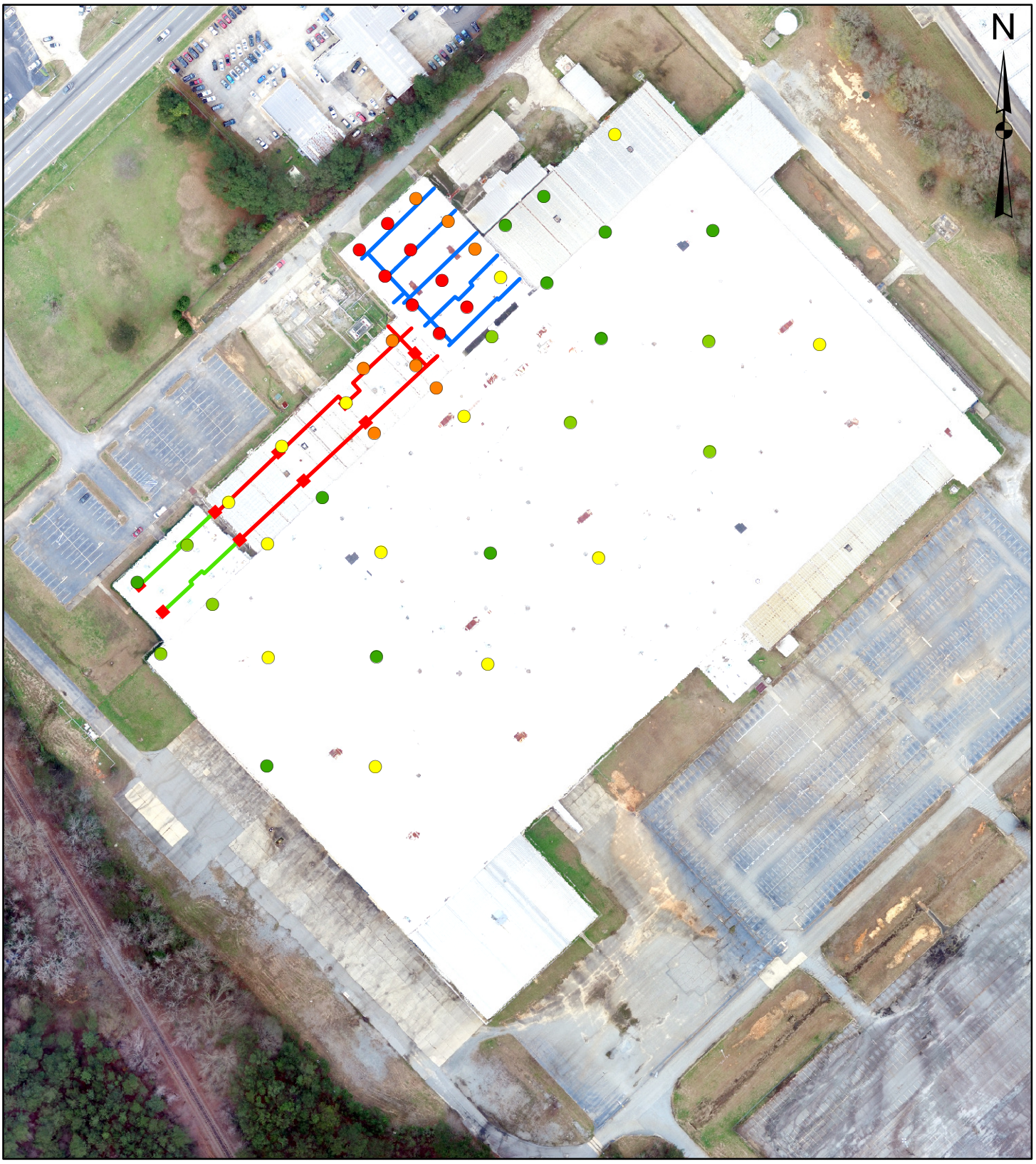
Release Area Treatment Zones

- Release Area Zone
- Plume Zone

In Situ Bioremediation Implementation Plan

Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 17

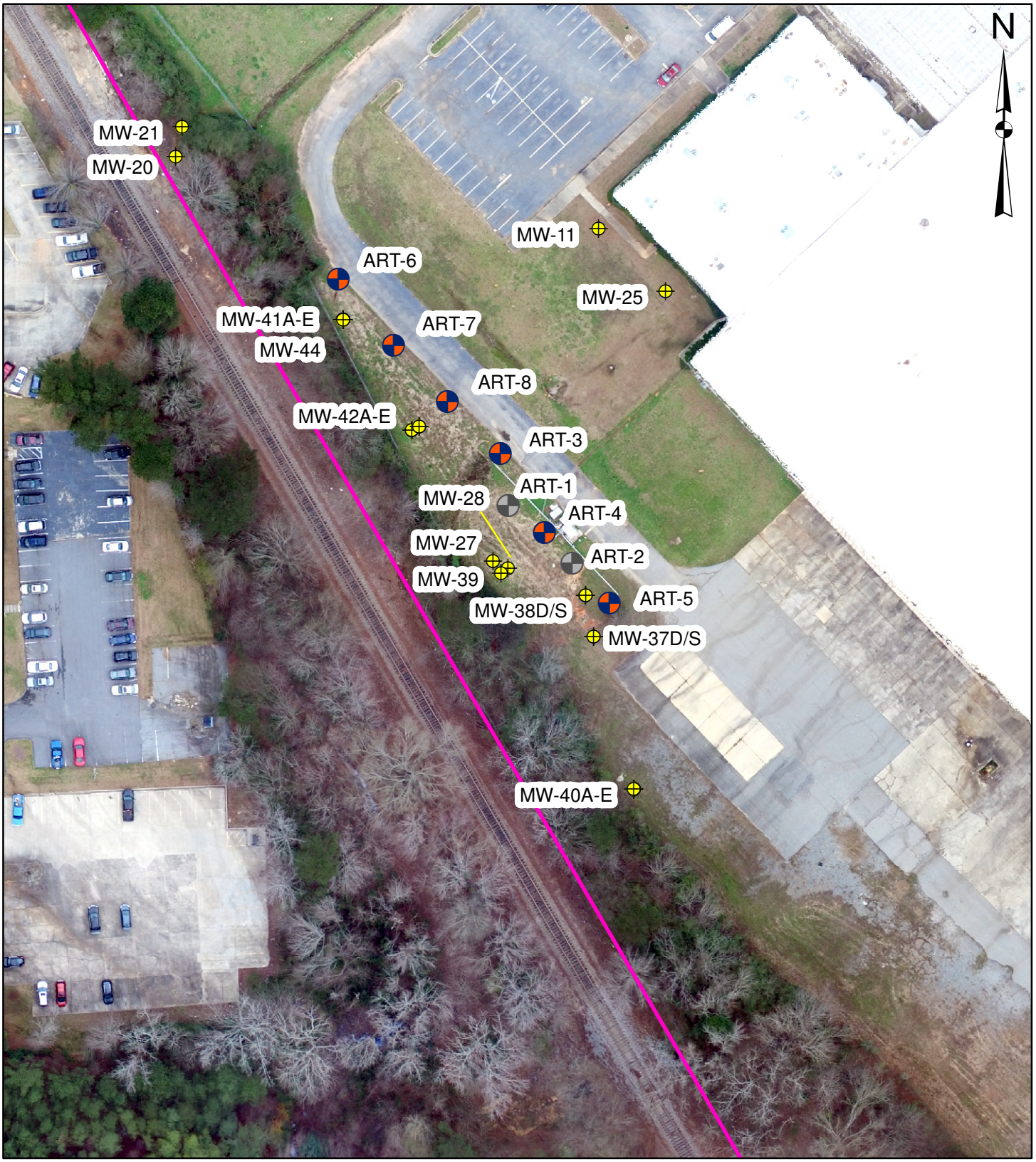


Sub-Slab Depressurization System
Layout and Sub-Slab Vapor Results

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.
G:\Rheem\VRP\VRP Progress Reports\5 May 2016\1 Figures\2016 Report Figures\MXD

Figure No. 18



Property Line ART System Final Plan

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.19

APPENDIX A
Professional Geologist Summary of Hours

Table 1
Well Construction Details
Rheem Manufacturing Company
Milledgeville, Georgia

Well No.	Total Depth (ft-bgs)	Screened/Open Depth Interval (ft-bgs)	Hydrogeologic Setting of Screened Interval	Installation Date
MW-1	44	29 - 44	Saprolite/PWR	11/02/88
MW-2	39	29 - 39	Saprolite/PWR	11/11/88
MW-3	40	30 - 40	Saprolite	11/09/88
MW-3A	135.5	125.5 - 135.5	Fractured Rock	09/12/90
MW-3B	209	199 - 209	Competent Rock	08/01/91
MW-4	24	14 - 24	Saprolite	11/08/88
MW-5	86.5	76.5 - 86.5	Fractured Rock	04/27/89
MW-6	125	120 - 125	Competent Rock	05/18/89
MW-7	50	40 - 50	PWR	06/29/89
MW-8	51	41 - 51	PWR	06/30/89
MW-9	45	35 - 45	PWR	06/29/89
MW-10	43	33 - 43	PWR	07/05/89
MW-11	68	58 - 68	PWR	11/30/89
MW-12	54	44 - 54	PWR	11/20/89
MW-12A	94.5	84.5 - 94.5	Competent Rock	09/13/90
MW-13	55	45 - 55	PWR	11/28/89
MW-14	49	39 - 49	PWR	11/21/89
MW-15	41.5	31.5 - 41.5	PWR	12/04/89
MW-16	35.5	25.5 - 35.5	PWR	12/05/89
MW-17	37	27 - 37	Saprolite/PWR	12/06/89
MW-18	17.5	2.5 - 17.5	Saprolite	12/06/89
MW-19	36	26 - 36	Saprolite/PWR	11/31/89
MW-20	24	9 - 24	Saprolite	01/23/90
MW-21	51	41 - 51	Saprolite	01/22/90
MW-22	80	70 - 80	Saprolite/PWR	06/20/91
MW-23	32	22 - 32	Saprolite	06/26/91
MW-24	195	175 - 195	Fractured Rock	06/08/10
MW-25	197	184 - 194	Fractured Rock	06/07/10
MW-26	131	121 - 131	Fractured Rock	06/09/10
MW-27	168	158 - 168	Fractured Rock	09/21/10
MW-28	100	90 - 100	Fractured Rock	09/23/10
MW-29	62	52 - 62	PWR	09/22/10
MW-30	73	63 - 73	PWR	09/24/10
MW-31	85	75 - 85	prolite/PWR/Fractured Ro	07/11/11
MW-32	87	77 - 87	prolite/PWR/Fractured Ro	07/11/11
MW-33	157	137 - 157	Fractured Rock	10/27/11
MW-34	182	172 - 182	PWR	07/12/12
MW-35	109	87 - 107	PWR	07/15/12
MW-36	62	50 - 60	PWR	09/20/12
MW-37S	40	30 - 40	PWR	09/21/12
MW-37D	87	77 - 87	PWR	09/21/12
MW-38S	40	30 - 40	PWR	09/22/12
MW-38D	77	67 - 77	PWR	09/22/12
MW-39	40	30 - 40	Saprolite	09/22/12
MW-40A	200	185 - 195	Bedrock	08/06/13
MW-40B	152*	140 - 150	Bedrock	08/06/13
MW-40C	92*	80 - 90	Bedrock	08/06/13

Table 1
Well Construction Details
Rheem Manufacturing Company
Milledgeville, Georgia

Well No.	Total Depth (ft-bgs)	Screened/Open Depth Interval (ft-bgs)	Hydrogeologic Setting of Screened Interval	Installation Date
MW-40D	72*	60 - 70	PWR	08/06/13
MW-40E	42*	30 - 40	PWR	08/06/13
MW-41A	200.5	195.5 - 200.5	Bedrock	07/28/13
MW-41B	142*	130 - 140	Bedrock	07/28/13
MW-41C	102*	90 - 100	Bedrock	07/28/13
MW-41D	82*	70 - 80	PWR	07/28/13
MW-41E	42*	30 - 40	PWR	07/28/13
MW-42A	200	182 - 192	Bedrock	08/05/13
MW-42B	174*	162 - 172	Bedrock	08/05/13
MW-42C	112*	100 - 110	Bedrock	08/05/13
MW-42D	85	75 - 85	PWR/Bedrock	08/06/13
MW-42E	42*	30 - 40	Saprolite/PWR	08/06/13
MW-43	112	97 - 107	PWR	08/10/13
MW-44	90	65 - 75	Bedrock	08/10/13
MW-45	95	85 - 95	PWR	12/17/13
MW-46	52	32 - 52	PWR	07/24/14
MW-47	94	74 - 94	Bedrock	07/25/14
MW-48A	98	78-98	Bedrock	01/21/15
MW-48B	73*	62-72	Bedrock	01/21/15
MW-48C	46*	35-45	PWR	01/21/15
MW-49A	88	78-88	Bedrock	01/22/15
MW-49B	69*	58-68	PWR/Bedrock	01/22/15
MW-49C	41*	30-40	Saprolite/PWR	01/22/15
MW-50A	138	123-138	Bedrock	01/24/15
MW-50B	115*	104-114	PWR/Bedrock	01/24/15
MW-50C	81*	70-80	PWR	01/24/15
MW-51A	109	99-109	Bedrock	01/26/15
MW-51B	95*	84-94	PWR	01/26/15
MW-51C	61*	50-60	PWR	01/26/15
MW-52A	144	125-135	Bedrock	01/28/15
MW-52B	91*	80-90	Bedrock	01/28/15
MW-52C	51*	40-50	PWR	01/28/15
MW-53A	137	127-137	Bedrock	01/30/15
MW-53B	121*	110-120	Bedrock	01/30/15
MW-53C	81*	70-80	PWR/Bedrock	01/30/15
MW-54	142	130-140	PWR	01/29/16
PZ-1	40	20 - 40	Saprolite	04/27/89
PZ-2 **	N/A	N/A	Saprolite	01/99 (1)
PZ-3	54	44 - 54	PWR	06/12/91
PZ-4	27.5	17.5 - 27.5	Saprolite	06/12/91
PZ-5	56	46 - 56	Saprolite	06/13/91
PZ-6	28	18 - 28	Saprolite	06/13/91
PZ-7	63	53 - 63	PWR	06/14/91
PZ-8	27	17 - 27	Saprolite	06/14/91
RW-1 ***	85	15 - 85	Saprolite/PWR	01/99 (2)
RW-2	90	20 - 90	Saprolite/PWR	06/30/91
RW-3	181	36 - 181	Saprolite/PWR/Bedrock	08/15/91

Table 1
Well Construction Details
Rheem Manufacturing Company
Milledgeville, Georgia

Well No.	Total Depth (ft-bgs)	Screened/Open Depth Interval (ft-bgs)	Hydrogeologic Setting of Screened Interval	Installation Date
RW-4	73	28 - 73	Saprolite/PWR/Bedrock	07/26/91
ART-1	106	6-66, 76-106	Saprolite/PWR/Bedrock	09/23/12
ART-2	105	10-55, 65-105	Saprolite/PWR/Bedrock	09/24/12
ART-3	125	12-72, 82-102, 105-125	Saprolite/PWR/Bedrock	07/23/13
ART-4	120	12-67, 77-97, 100-120	Saprolite/PWR/Bedrock	07/25/13
ART-5	120	12-67, 77-97, 100-120	Saprolite/PWR/Bedrock	07/28/13
ART-6	125	15-95, 105-125	Saprolite/PWR/Bedrock	02/19/16
ART-7	120	10-90, 100-120	Saprolite/PWR	02/22/16
ART-8	120	10-90, 100-120	Saprolite/PWR	02/25/16

Notes:
ft-bgs: feet below ground surface
N/A: Information currently not available
* Depth to bottom of sand pack. Well clusters were installed in single boring.
** The original PZ-2 installation date is unknown. The well was replaced in in 1/99 due to destruction by a run-away trailer from Roberson Mill Road.
*** The original RW-1 was installed in 6/21/89. The well was replaced in 1/99 due to collapse of the well.

Table 2
Groundwater Sampling Results - Off-Property Monitoring Wells
Rheem Manufacturing Company
Milledgeville, Georgia

Well No.	2012	2013		2014			2015		2016	
	Dec	Jun	Aug	Mar	Jul	Sep	Mar	Oct	Feb	Apr
	TCE	TCE	TCE	TCE	TCE	TCE	TCE	TCE	TCE	TCE
MW-33	100	53		36		86	140	150		90
MW-34	45			41		48	53	57		60
MW-35	ND			NA		ND	NA	NA		ND
MW-36	ND	ND		ND		ND	ND	ND		ND
MW-43			170	150		150	170	140		150
MW-44			ND	ND		ND	ND	ND		ND
MW-45				ND		ND	ND	ND		ND
MW-46					9.8	15	15	21		23
MW-47					ND	ND	ND	ND		ND
MW-54									ND	ND

Notes:
Results are in micrograms per liter (µg/L)
ND: Not Detected
NA: Well Not Accessible
Blank: Well Not Sampled

Table 3
Groundwater Elevation Summary - Off-Property Monitoring Wells
Rheem Manufacturing Company
Milledgeville, Georgia

Well No.	Date Measured	Top of Casing Elevation (ft-amls)	Depth to Groundwater (ft)	Groundwater Elevation (ft-amls)
MW-33	4/27/2016	392.08	29.46	362.62
MW-34	4/28/2016	352.76	0.55	352.21
MW-35	4/26/2016	364.16	1.24	362.92
MW-36	4/26/2016	339.48	4.09	335.39
MW-43	4/27/2016	392.91	25.65	367.26
MW-44	4/28/2016	361.74	6.74	355.00
MW-45	4/26/2016	393.98	23.45	370.53
MW-46	4/28/2016	359.01	2.49	356.52
MW-47	4/28/2016	347.98	5.08	342.90
MW-54	4/26/2016	389.92	19.57	370.35

Notes:
NA: Not Accessible
ft-amls: feet above mean sea level

Table 4
Geological Interpretation of Screened Intervals of Site Wells
Rheem Manufacturing Company
Milledgeville, Georgia

Location	Dilling Method	Boring Depth (ft-bgs)	Depth to PWR (ft-bgs)	Depth to Rock (ft-bgs)	Screen Top (ft-bgs)	Screen Bottom (ft-bgs)	Original Interpretation: Hydrogeologic Setting Screened Interval	Refined Interpretation: Hydrogeologic Setting Screened Interval
MW-1	hollow stem auger	44	44	> 44	28	44	Soil	Saprolite/PWR
MW-2	hollow stem auger	39	35	> 39	29	39	Soil	Saprolite/PWR
MW-3	hollow stem auger	59	59	>59	30	40	Soil	Saprolite
MW-3A	rotary / core	135.5	59	109	125.5	135.5	Bedrock	Fractured Rock
MW-3B	rotary / core	209.63	59	109	200.72	209.63	Bedrock	Competent Rock
MW-4	hollow stem auger	25	> 25	> 25	13	23	Soil	Saprolite
MW-5	rotary / core	86.5	44	71	76.5	86.5	Bedrock	Fractured Rock
MW-6	rotary / core	125	44	72.5	120	125	Bedrock	Competent Rock
MW-7	hollow stem auger	49.6	37	> 50	39	49	PWR	PWR
MW-8	hollow stem auger	56.5	37	> 56	41	51	PWR	PWR
MW-9	hollow stem auger	45	26	> 45	35	45	PWR	PWR
MW-10	hollow stem auger	43	29	> 43	33	43	PWR	PWR
MW-11	hollow stem auger	68	52.5	> 68	58	68	PWR	PWR
MW-12	hollow stem auger	54	37.5	> 54	44	54	PWR	PWR
MW-12A	rotary / core	94.5	48.9	64.5	84.5	94.5	Bedrock	Competent Rock
MW-13	hollow stem auger	55	32.5	> 33	45	55	PWR	PWR
MW-14	hollow stem auger	49	32.5	> 49	39	49	PWR	PWR
MW-15	hollow stem auger	41.5	22.5	> 41	31.5	41.5	PWR	PWR
MW-16	hollow stem auger	35.5	26	> 35	25.5	35.5	PWR/Soil	PWR
MW-17	hollow stem auger	37	32.5	> 37	27	37	PWR/Soil	Saprolite/PWR
MW-18	hollow stem auger	17.5	> 18	> 18	2.5	17.5	Soil	Saprolite
MW-19	hollow stem auger	36	32.5	> 36	26	36	PWR/Soil	Saprolite/PWR
MW-20	hollow stem auger	24.5	> 25	> 25	8	23	Soil	Saprolite
MW-21	hollow stem auger	51	51	> 51	41	51	Soil	Saprolite
MW-22	hollow stem auger	80.2	59	80	70	80	PWR	Saprolite/PWR
MW-23	hollow stem auger	32	> 32	> 32	22	32	Soil	Saprolite
MW-24	HSA/sonic	200	46	96	175	195	Bedrock	Fractured Rock
MW-25	HSA/sonic	200	48	108	184	194	Bedrock	Fractured Rock
MW-26	HSA/sonic	200	33	82	121	131	Bedrock	Fractured Rock
MW-27	sonic	170	28	98	158	168	Bedrock	Fractured Rock
MW-28	sonic	99.81	28	98	89.8	99.8	PWR	Fractured Rock
MW-29	sonic	77	21	63	52	62	PWR	PWR
MW-30	sonic	82	44	72	65	75	PWR	PWR
MW-31	sonic	192	18	79	75	85	PWR	Saprolite/PWR/Fractured Rock
MW-32	sonic	197	17	82	77	87	PWR	Saprolite/PWR/Fractured Rock
MW-33	sonic	190	67	112	137	157	Bedrock	Fractured Rock
MW-34	sonic	207	23	183	172	182	PWR	PWR
MW-35	sonic	197	8	52	87	107	PWR	PWR
MW-36	sonic	197	12	60	50	60	PWR	PWR
MW-37S	sonic	87	17	> 87	30	40	Soil	PWR
MW-37D	sonic	87	17	> 87	77	87	PWR	PWR
MW-38S	sonic	77	18	> 77	30	40	Soil	PWR
MW-38D	sonic	77	18	> 77	67	77	PWR	PWR
MW-39	sonic	40	28	> 40	30	40	Soil	Saprolite
MW-40A	sonic	200	18	60	185	195		Bedrock
MW-40B	sonic	200	18	60	140	150		Bedrock
MW-40C	sonic	200	18	60	80	90		Bedrock
MW-40D	sonic	200	18	60	60	70		PWR
MW-40E	sonic	200	18	60	30	40		PWR
MW-41A	sonic	200.5	30	88	195.5	200.5		Bedrock
MW-41B	sonic	200.5	30	88	130	140		Bedrock
MW-41C	sonic	200.5	30	88	90	100		Bedrock
MW-41D	sonic	200.5	30	88	70	80		PWR
MW-41E	sonic	200.5	30	88	30	40		PWR
MW-42A	sonic	200	24	80	182	192		Bedrock
MW-42B	sonic	200	24	80	162	172		Bedrock
MW-42C	sonic	200	24	80	100	110		Bedrock

Table 4
Geological Interpretation of Screened Intervals of Site Wells
Rheem Manufacturing Company
Milledgeville, Georgia

Location	Dilling Method	Boring Depth (ft-bgs)	Depth to PWR (ft-bgs)	Depth to Rock (ft-bgs)	Screen Top (ft-bgs)	Screen Bottom (ft-bgs)	Original Interpretation: Hydrogeologic Setting Screened Interval	Refined Interpretation: Hydrogeologic Setting Screened Interval
MW-42D	sonic	85	24	80	75	85		PWR/Bedrock
MW-42E	sonic	85	24	80	30	40		Saprolite/PWR
MW-43	sonic	112	30	108	97	107		PWR
MW-44	sonic	90	12	70	65	75		Bedrock
MW-45	sonic	95	5	> 95	85	95		PWR
MW-46	sonic	56	10	54	32	52		PWR
MW-47	sonic	100	7	94	74	94		Bedrock
MW-48A	sonic	98	25	72	78	98		Bedrock
MW-48B	sonic	98	25	72	62	72		Bedrock
MW-48C	sonic	98	25	72	35	45		PWR
MW-49A	sonic	98	27	63	78	88		Bedrock
MW-49B	sonic	98	27	63	58	68		PWR/Bedrock
MW-49C	sonic	98	27	63	30	40		Saprolite/PWR
MW-50A	sonic	138	39	111	123	138		Bedrock
MW-50B	sonic	138	39	111	104	114		PWR/Bedrock
MW-50C	sonic	138	39	111	70	80		PWR
MW-51A	sonic	109	39	95	99	109		Bedrock
MW-51B	sonic	109	39	95	84	94		PWR
MW-51C	sonic	109	39	95	50	60		PWR
MW-52A	sonic	144	22	65	125	125		Bedrock
MW-52B	sonic	144	22	65	80	90		Bedrock
MW-52C	sonic	144	22	65	40	50		PWR
MW-53A	sonic	137	6	75	127	137		Bedrock
MW-53B	sonic	137	6	75	110	120		Bedrock
MW-53C	sonic	137	6	75	70	80		PWR/Bedrock
MW-54	sonic	142	15	142	130	140		PWR
PZ-1	hollow stem auger	40	> 40	> 40	20	40	Soil	Saprolite
PZ-2	hollow stem auger		> 16	> 16			N/A	Saprolite
PZ-3	hollow stem auger	54.5	54.5	> 55	44	54	PWR	PWR
PZ-4	hollow stem auger	28	> 28	> 28	23	28	Soil	Saprolite
PZ-5	hollow stem auger	56	56	> 56	46	56	Soil	Saprolite
PZ-6	hollow stem auger	28	> 28	> 28	18	28	Soil	Saprolite
PZ-7	hollow stem auger	64	37	64	53	63	PWR	PWR
PZ-8	hollow stem auger	27	> 27	> 27	17	27	Soil	Saprolite
RW-1	rotary	85	< 85	> 85	15	85		Saprolite/PWR
RW-2	rotary	89	69	> 89	22	89		Saprolite/PWR
RW-3	rotary	187	59	109	37	187		Saprolite/PWR/Bedrock
RW-4	rotary	74.3	48.9	64.5	28	73		Saprolite/PWR/Bedrock
ART-1	sonic	106	16	85	6	106		Saprolite/PWR/Bedrock
ART-2	sonic	105	24	83	10	105		Saprolite/PWR/Bedrock
ART-3	sonic	125	14	80	12	125		Saprolite/PWR/Bedrock
ART-4	sonic	120	32	90	12	120		Saprolite/PWR/Bedrock
ART-5	sonic	120	30	70	12	120		Saprolite/PWR/Bedrock
ART-6	sonic	125	20	120	15	125		Saprolite/PWR/Bedrock
ART-7	sonic	120	30	> 120	10	120		Saprolite/PWR
ART-8	sonic	120	25	116	10	120		Saprolite/PWR

Table 5
Risk Reduction Standard Comparison to Soil Concentrations
Rheem Manufacturing Company
Milledgeville, Georgia

Surface Soil (SS, <= 2 ft)

Parameter	Nonresidential SS RRS (mg/kg)	Maximum Detected Concentration in SS (mg/kg)	# samples above RRS / # samples	95% UCL (mg/kg)
2-Butanone (MEK)	200	0.49	0/15	
Acetone	400	0.28	0/16	
Chloroform	4.9	0.013	0/14	
cis-1,2-Dichloroethene	7	0.024	0/16	
Trichloroethene				
All Soil	0.5	1100	6/24	511.1
Soil Outside SVE and Bldg	0.5	1.9	2/15	0.503-0.519

Subsurface Soil (SB, > 2 ft)

Parameter	Nonresidential SB RRS (mg/kg)	Maximum Detected Concentration in SB (mg/kg)	# samples above RRS / # samples	95% UCL (mg/kg)
1,1,1-Trichloroethane	96	0.011	0/87	
1,1,2-Trichloroethane	0.5	0.017	0/87	
1,1-Dichloroethene	3.8	0.027	0/111	
2-Butanone (MEK)	200	10	0/87	
Acetone	400	0.45	0/87	
Carbon tetrachloride	0.5	0.01	0/87	
Chloroform	8	0.035	0/87	
cis-1,2-Dichloroethene	7	0.85	0/111	
Dichlorobromomethane	8	0.018	0/87	
Dichloromethane	2.3	0.064	0/87	
Ethyl benzene	70	2.5	0/87	
Freon-12	100	0.086	0/87	
m&p-Xylene	20	8.1	0/87	
o-Xylene	20	2.7	0/87	
Tetrachloroethene	0.89	0.011	0/87	
Toluene	100	0.33	0/87	
trans-1,2-Dichloroethene	13	0.057	0/111	
Trichloroethene				
All Soil	0.5	78000	170/317	2501
Soil Outside SVE and Bldg	0.5	26	7/83	3.9

Table 6
Risk Reduction Standard Comparison to Groundwater Concentrations
Rheem Manufacturing Company
Milledgeville, Geogia

Groundwater On-Site (2014-2016)

Parameter	Residential RRS (mg/L)	Nonresidential RRS (mg/L)	Maximum Detected Concentration On-Site (mg/L)	# samples above Residential RRS / # samples	# samples above NonResidential RRS / # samples
1,1,2-Trichloroethane	0.005	0.005	0.017	1/41	1/41
1,1-Dichloroethene	0.10	0.52	0.18	1/48	0/48
2-Butanone (MEK)	2.3	12	0.054	0/41	0/41
Acetone	8.0	46	0.33	0/44	0/44
Chloroform	0.08	0.08	0.019	0/50	0/50
cis-1,2-Dichloroethene	0.07	0.20	0.10	3/79	0/79
Tetrachloroethene	0.019	0.098	0.053	4/44	0/44
Trichloroethene	0.005	0.0052	70	85/99	84/99
Vinyl chloride	0.002	0.0033	0.020	7/47	7/47

Groundwater Off-Site (2014-2016)

Parameter	Residential RRS (mg/L)	Nonresidential RRS (mg/L)	Maximum Detected Concentration Off-Site (mg/L)	# samples above Residential RRS / # samples	# samples above NonResidential RRS / # samples
Chloroform	0.08	0.08	0.0055	0/39	0/39
cis-1,2-Dichloroethene	0.07	0.20	0.049	0/40	0/40
Dichloromethane	0.074	0.45	0.008	0/39	0/39
Trichloroethene	0.005	0.0052	0.17	22/46	22/46
Vinyl chloride	0.002	0.0033	0.0054	2/39	2/39

Table 7
Soil Vapor Extraction Well Construciton Details
Rheem Manufacturing Company
Milledgeville, Georgia

Well No.	Date of Install	Total Depth (ft-bgs)	Screen Top (ft-bgs)	Screen Bottom (ft-bgs)	FracDepth (ft-bgs)	Frac Volume (ft^3)	Estimated Frac Area Range (ft^2)	
FW-1-5	Feb-14	7.5	5	7	5	4	76	122
FW-1-10	Feb-14	11.5	9	11	10	8	152	244
FW-1-15	Feb-14	16.5	14	16	15	12	229	366
FW-1-20	Feb-14	21.5	19	21	20	15	305	457
FW-1-25	Feb-14	26.5	24	26	25	15	381	457
FW-2-5	Feb-14	6.5	4	6	5	4	76	122
FW-2-10	Feb-14	11.5	9	11	10	8	152	244
FW-2-15	Feb-14	16.5	14	16	15	12	229	366
FW-2-20	Feb-14	21.5	19	21	20	15	305	457
FW-2-25	Feb-14	26.5	24	26	25	15	381	457
FW-3-7.5	Feb-14	9	6.5	8.5	7.5	4	114	122
FW-3-12.5	Feb-14	14	11.5	13.5	12.5	8	191	244
FW-3-16.5	Feb-14	18	15.5	17.5	16.5	12	251	366
FW-3-21	Feb-14	22.5	20	22	21	15	320	457
FW-3-24	Feb-14	25.5	23	25	24	15	366	457
FW-4-7.5	Feb-14	9	6.5	8.5	7.5	4	114	122
FW-4-12.5	Feb-14	14	11.5	13.5	12.5	8	191	244
FW-4-16.5	Feb-14	18	15.5	17.5	16.5	12	251	366
FW-4-21	Feb-14	22.5	20	22	21	14	320	427
FW-4-24	Feb-14	25.5	23	25	24	16	366	488
FW-5-7.5	Feb-14	9	7	9	8	3.25	122	99
FW-5-12.5	Feb-14	14	11.5	13.5	12.5	8	191	244
FW-5-16.5	Feb-14	18	15.5	17.5	16.5	12	251	366
FW-5-21	Feb-14	22.5	20	22	21	15	320	457
FW-5-24	Feb-14	25.5	23	25	24	15	366	457
FW-6-5	Feb-14	6.5	5	7	6	3.25	91	99
FW-6-10	Feb-14	11.5	9	11	10	8	152	244
FW-6-15	Feb-14	16.5	14	16	15	12	229	366
FW-6-20	Feb-14	21.5	19	21	20	15	305	457
FW-6-25	Feb-14	26.5	24	26	25	15	381	457
FW-7-5	Feb-14	6.5	4	6	5	4	76	122
FW-7-10	Feb-14	11.5	9	11	10	8	152	244
FW-7-15	Feb-14	16.5	14	16	15	12	229	366
FW-7-20	Feb-14	21.5	19	21	20	15	305	457
FW-7-25	Feb-14	26.5	24	26	25	15	381	457
FW-8-7.5	Feb-14	9	6.5	8.5	7.5	4	114	122
FW-8-12	Feb-14	13.5	11	13	12	8	183	244
FW-8-16	Feb-14	17.5	15	17	16	12	244	366
FW-8-21	Feb-14	22.5	20	22	21	15	320	457
FW-8-24	Feb-14	25.5	23	25	24	15	366	457

Notes:
ft-bgs: feet below ground surface

APPENDIX A
Professional Geologist Summary of Hours

Environmental Planning Specialists, Inc.
Justin Vickery
Project Hours
November 2015 through April 2016

	Nov 15	Dec 15	Jan 16	Feb 16	Mar 16	Apr 16	TOTAL
Total Hours per Month	30.75	14.75	71.00	15.50	64.75	92.50	289.25

APPENDIX B
Milestone Schedule

PROJECTED MILESTONE SCHEDULE
Rheem Manufacturing Company
Milledgeville, GA

ID	Task Name	2013	2014				2015				2016				2017				2018		
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
1	VRP Enrollment																				
2	Cost Estimate																				
3	Financial Assurance																				
4	Updated Financial Assurance																				
5	Soil Delineation (completed prior to VRP enrollment)*																				
6	On-site Horzontal Groundwater Delineation (completed prior to VRP enrollment)*																				
7	Off-site Horizontal Groundwater Delineation																				
8	Apply to Include Off-Site Properties In VRP																				
9	Vertical Groundwater Delineation (if necessary)																				
10	Semi-Annual Progress Reports																				
11	Updated CSM, Final Remdiation Plan, and Prelinimary Cost Estimate																				
12	Remedial Activities																				
13	Compliance Status Report																				

Notes: Dark gray shading indicates portion of schedule that has passed.
Planned activity
Activity completed/conducted to date
* Documented in the Voluntary Remediation Program Application Update 1, October 2012

APPENDIX C
Boring Logs and Well Construction Information

PROJECT:

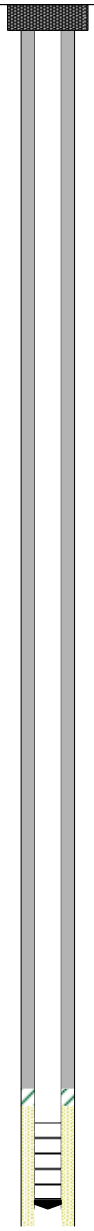
Rheem Manufacturing Company

Log of Boring No. MW-54

SITE LOCATION:	Milledgeville, GA	TOP OF CASING ELEVATION (ft):	N/A
DRILLING CONTRACTOR:	DrillPro, LLC: Groundwater Protection	DATE STARTED: 1/25/2016	DATE FINISHED: 1/29/2016
DRILLING METHOD:	Rotosonic	TOTAL DEPTH (ft.): 142	SCREEN INTERVAL (ft.): 130-140
DRILLING EQUIPMENT:	Geoprobe 8140LS	DEPTH TO WATER AT TIME OF BORING (ft.): NM	CASING (ft.): 0-130
SAMPLING METHOD:	Sample Sleeves	BOREHOLE DIAMETER (In.): 6.25	WELL DIAMETER (In.): 2
LOGGED BY:	Alex Testoff		

Ground Surface Elevation (ft): N/A

DEPTH (feet)	SAMPLES: Sample No. Location	SAMPLES: Blows/ Foot	PID Reading	DESCRIPTION	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0			0	Topsoil	
5			20.8	Red clay	
10				Tan, orange clay	
			0.1	Tan, orange clay w/ weathered rock	
15			0.8	Tan, white weathered rock	
20			0.9	Tan weathered rock w/ clay	
25			6.1		
30			15	Red, brown clay w/ weathered rock	
35			56.2	Tan, brown, white weathered rock	
40			40.7	Brown, orange weathered rock	
45			57.1	Tan, light brown weathered rock	
50			20.5		
55			0.9	Tan, orange, white weathered rock	
60			13.3		
65			30	Tan, white weathered rock	
70			10.2	Orange, light brown weathered rock	
75			50.6		
80			9.3		
85			264.8	Tan, brown, white weathered rock	
90			15.6	Gray, orange weathered rock	
95			0.4	Gray, pink pulverized weathered rock	
100			11.6	Gray, pink gneiss	
105			0.9	Gray clayey, pulverized weathered rock	
110			6.8	Gray, white, pink clayey weathered rock	
115			0.1	Gray pulverized weathered rock w/ large gneiss rock	
120			0.1	Gray, white, pink gneiss	
125			12.2	Gray, white, pulverized clayey weathered rock w/ large gneiss rock	
130			12.2		
135			19.4	Gray weathered rock w/ large grey, white, pink gneiss rock	
140			0.9	Fine grain, gray, white weathered rock w/ large gneiss rock	
145				Gray, white, pink gneiss	



Boring terminated at ~142 ft. bgs

EPS

PROJECT:

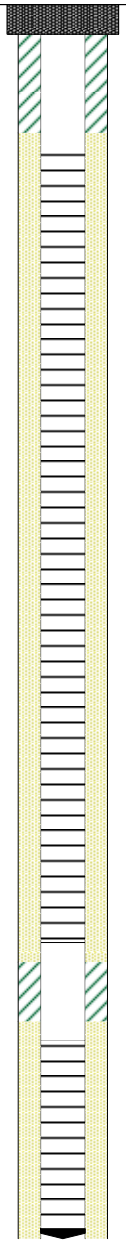
Rheem Manufacturing Company

Log of Boring No. ART-6

SITE LOCATION:	Milledgeville, GA	TOP OF CASING ELEVATION (ft):	N/A
DRILLING CONTRACTOR:	DrillPro, LLC: Groundwater Protection	DATE STARTED: 2/16/2016	DATE FINISHED: 2/19/2016
DRILLING METHOD:	Rotosonic	TOTAL DEPTH (ft.): 125	SCREEN INTERVAL (ft.): See Below
DRILLING EQUIPMENT:	Sonic D-120	DEPTH TO WATER AT TIME OF BORING (ft.): NM	CASING (ft.): See Below
SAMPLING METHOD:	Sample Sleeves	BOREHOLE DIAMETER (In.): 10.25	WELL DIAMETER (In.): 6
LOGGED BY:	Alex Testoff		

Ground Surface Elevation (ft): N/A

DEPTH (feet)	SAMPLES: Sample No. Location	SAMPLES: Blows/ Foot	PID Reading	DESCRIPTION	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0			10.2	Topsoil	
5			9.7	Red, orange clay	
10			10.9	Orange, tan, gray clay	
15			15.2	Orange, tan, gray clay with weathered rock	
20			9.7	Tan, orange, white fine-grain weathered rock w/ clay	
25					
30			14.9	Tan clay w/ weathered rock	
35					
40			60.1	White, tan, gray weathered rock	
45					
50			90	White, tan, weathered rock w/ clay	
55			150.1	Brown, tan, pink weathered rock	Screened from 15-95 ft. bgs
60			25.2	Brown, gray weathered rock w/ clay	
65			9.6	White, tan weathered rock	
70			9.3	Gray, white weathered rock	
75			16.6	Tan, white weathered rock	
80			16.7	Orange, tan, white clayey weathered rock	
85			268.3	White, gray, pink weathered rock	
90			36.4	White, pink coarse-grain weathered rock	
95			9.9	White, tan weathered rock w/ clay	
100			587.7	Gray, tan weathered rock	Casing from 95-105 ft. bgs
105			20	Gray, pink coarse-grain clayey weathered rock	
110			1.5	Gray, white clayey weathered rock	Screened from 105-125 ft. bgs
115				Gray, white, pink clayey weathered rock	
120			37.4	Gray, white clayey weathered rock	
125			2.3	Gray, white gneiss	Boring terminated at ~125 ft. bgs



EPS

PROJECT:

Rheem Manufacturing Company

Log of Boring No. ART-7

SITE LOCATION:	Milledgeville, GA	TOP OF CASING ELEVATION (ft):	N/A
DRILLING CONTRACTOR:	DrillPro, LLC: Groundwater Protection	DATE STARTED: 2/20/2016	DATE FINISHED: 2/22/2016
DRILLING METHOD:	Rotosonic	TOTAL DEPTH (ft.): 120	SCREEN INTERVAL (ft.): See Below
DRILLING EQUIPMENT:	Sonic D-120	DEPTH TO WATER AT TIME OF BORING (ft.): NM	CASING (ft.): See Below
SAMPLING METHOD:	Sample Sleeves	BOREHOLE DIAMETER (In.): 10.25	WELL DIAMETER (In.): 6
LOGGED BY:	Alex Testoff		

Ground Surface Elevation (ft): N/A

DEPTH (feet)	SAMPLES: Sample No. Location	SAMPLES: Blows/ Foot	PID Reading	DESCRIPTION	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0				Topsoil	
5			16.9	Red, orange sandy clay	
10				Tan, red clay	
15			14.7	Gray, tan, orange clay	
20					
25			21.2	Tan, orange clay w/ black mottling	
			20	Tan clay w/ weathered rock and black mottling	
30			14.7		
35			27.8	Tan, white weathered rock	
40			20.1		
45			10.8	White, tan weathered rock	
50			31.3	Orange, tan clayey weathered rock	Screened from 10-90 ft. bgs
55			40	Light brown, tan weathered rock	
60			461.2	White, tan, pink clayey weathered rock	
65			97.7	Tan, pink, white, coarse-grain weathered rock	
70			88.8	Pulverized gray weathered rock	
75			29.8	Gray, pink gneiss w/ pulverized weathered rock	
80			40	Gray, pink weathered rock	
85			51.6	Pulverized gray weathered rock	
90			0	Gray, pink clayey weathered rock w/ large gneiss rock	
			1.9	Gray, white, pink gneiss	
95			2.2	Gray, white, pink gneiss w/ clayey weathered rock	Casing from 90-100 ft. bgs
100			15.7		
105			12.9	Pulverized gray weathered rock	Screened from 100-120 ft. bgs
110			20.6	Gray clayey weathered rock	
115			8.8	Pulverized gray weathered rock	
120					Boring terminated at ~120 ft. bgs
125					

EPS

PROJECT:

Rheem Manufacturing Company

Log of Boring No. ART-8

SITE LOCATION:	Milledgeville, GA	TOP OF CASING ELEVATION (ft):	N/A
DRILLING CONTRACTOR:	DrillPro, LLC: Groundwater Protection	DATE STARTED: 2/22/2016	DATE FINISHED: 2/25/2016
DRILLING METHOD:	Rotosonic	TOTAL DEPTH (ft.): 120	SCREEN INTERVAL (ft.): See Below
DRILLING EQUIPMENT:	Sonic D-120	DEPTH TO WATER AT TIME OF BORING (ft.): NM	CASING (ft.): See Below
SAMPLING METHOD:	Sample Sleeves	BOREHOLE DIAMETER (In.): 10.25	WELL DIAMETER (In.): 6
LOGGED BY:	Alex Testoff		

Ground Surface Elevation (ft): N/A

DEPTH (feet)	SAMPLES: Sample No. Location	SAMPLES: Blows/ Foot	PID Reading	DESCRIPTION	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0				Topsoil	
5			30.9	Tan, gray sandy clay	
10				Tan, orange sandy clay	
15			11.8	Red, tan clay	
20			24.7		
25			3.9	Tan weathered rock	
30			16.2	Tan, brown weathered rock Tan, pink weathered rock	
35			12.9	Tan weathered rock w/ clay Tan, white weathered rock	
40			16.8	Tan, white weathered rock w/ clay	
45			41	Tan, white weathered rock	
50			29.6	White, tan weathered rock	Screened from 10-90 ft. bgs
55			76.6	Clayey tan weathered rock	
60				No recovery	
65			106.2	Tan, white weathered rock	
70			144.2	Gray clayey weathered rock	
75			18.7	Pulverized gray weathered rock Gray clayey weathered rock	
80			128.4	Gray pulverized weathered rock w/ gray, pink gneiss	
85			9.7	Clayey weathered rock w/ large gneiss rock Gray, pink gneiss	
90					
95			9.9		Casing from 90-100 ft. bgs
100			24.4	Gray pulverized weathered rock w/ large gneiss rock	
105			19.8		Screened from 100-120 ft. bgs
110			8.7	Gray, pink clayey weathered rock	
115			10.2	Gray, pink gneiss Pulverized gray weathered rock	
120				Gray, white gneiss	Boring terminated at ~120 ft. bgs
125					

EPS

APPENDIX D
Laboratory Analytical Reports

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

December 22, 2015

Justin Vickery
Environmental Planning Specialists, Inc.
1050 Crown Pointe Parkway
Atlanta GA 30338

TEL: (404) 315-9113
FAX: (404) 315-8509

RE: Rheem

Dear Justin Vickery: Order No: 1512F66

Analytical Environmental Services, Inc. received 9 samples on 12/16/2015 2:35:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES' certifications are as follows:
-NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water Microbiology, effective 07/01/15-06/30/16.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/17.

These results relate only to the items tested. This report may only be reproduced in full.

If you have any questions regarding these test results, please feel free to call.

CRKanhai

Chantelle Kanhai
Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC

3080 Presidential Drive, Atlanta GA 30340-3704

AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1512F66

Date: 12-16-15 Page 1 of 1

COMPANY: EPS Inc.

ADDRESS: 1050 Crown Pointe Pkwy Ste 550 Atlanta, GA 30338

PHONE: 404 315 9113

FAX:

SAMPLED BY: Alex Testoff

SIGNATURE: Alex Testoff

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	VOCs	PRESERVATION (See codes) HNO3	REMARKS	No # of Containers
1	15350-MW-37D-P	12-16-15	8:00	X		GW	X	X		2
2	1530-MW-37S-P	12-16-15	8:16	X		GW	X	X		2
3	15350-MW-38S-P	12-16-15	8:32	X		GW	X	X		2
4	15350-MW-38D-P	12-16-15	8:49	X		GW	X	X		2
5	15350-MW-27-P	12-16-15	9:08	X		GW	X	X		2
6	15350-MW-39-P	12-16-15	9:20	X		GW	X	X		2
7	15350-MW-28-P	12-16-15	9:35	X		GW	X	X		2
8	15350-Blank-P	12-16-15	9:46	X		W	X	X		2
9	15350-DUP-P	12-16-15	12:00	X		GW	X	X		2
10										
11										
12										
13										
14										

ANALYSIS REQUESTED

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Alex Testoff	12-16-15 14:35	1:	12/16/15 14:35
2:		2:	
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD

OUT / / VIA:

IN / / VIA:

CLIENT FedEx UPS MAIL COURIER GREYHOUND OTHER_____

PROJECT INFORMATION

PROJECT NAME: Rheem

PROJECT #:

SITE ADDRESS: Milledgeville, GA

SEND REPORT TO: jyducey@epsplanning.com & atestoff@epsplanning.com

INVOICE TO: (IF DIFFERENT FROM ABOVE)

QUOTE #:_____ PO#:_____

RECEIPT

Total # of Containers: 18

Turnaround Time Request

- (●) Standard 5 Business Days
- ( ) 2 Business Day Rush
- ( ) Next Business Day Rush
- ( ) Same Day Rush (auth req.)
- ( ) Other _____

STATE PROGRAM (if any): _____

E-mail? Y / N; Fax? Y / N

DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES. SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-37D-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:00:00 AM
Lab ID:	1512F66-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 15:53	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 15:53	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 15:53	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 15:53	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 15:53	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 15:53	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 15:53	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 15:53	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-37D-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:00:00 AM
Lab ID:	1512F66-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Trichloroethene	53	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 15:53	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 15:53	CH
Surr: 4-Bromofluorobenzene	98	70.7-125		%REC	217463	1	12/21/2015 15:53	CH
Surr: Dibromofluoromethane	98.6	82.2-120		%REC	217463	1	12/21/2015 15:53	CH
Surr: Toluene-d8	100	81.8-120		%REC	217463	1	12/21/2015 15:53	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-37S-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:16:00 AM
Lab ID:	1512F66-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 16:17	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 16:17	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 16:17	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 16:17	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 16:17	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 16:17	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 16:17	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 16:17	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-37S-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:16:00 AM
Lab ID:	1512F66-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Trichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:17	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 16:17	CH
Surr: 4-Bromofluorobenzene	99.1	70.7-125		%REC	217463	1	12/21/2015 16:17	CH
Surr: Dibromofluoromethane	99.4	82.2-120		%REC	217463	1	12/21/2015 16:17	CH
Surr: Toluene-d8	102	81.8-120		%REC	217463	1	12/21/2015 16:17	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-38S-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:32:00 AM
Lab ID:	1512F66-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 16:40	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 16:40	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 16:40	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 16:40	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 16:40	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 16:40	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 16:40	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 16:40	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-38S-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:32:00 AM
Lab ID:	1512F66-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Trichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 16:40	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 16:40	CH
Surr: 4-Bromofluorobenzene	99.9	70.7-125		%REC	217463	1	12/21/2015 16:40	CH
Surr: Dibromofluoromethane	94.8	82.2-120		%REC	217463	1	12/21/2015 16:40	CH
Surr: Toluene-d8	99.2	81.8-120		%REC	217463	1	12/21/2015 16:40	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-38D-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:49:00 AM
Lab ID:	1512F66-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 17:04	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 17:04	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 17:04	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 17:04	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 17:04	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 17:04	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 17:04	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 17:04	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-38D-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 8:49:00 AM
Lab ID:	1512F66-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Trichloroethene	6.8	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:04	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 17:04	CH
Surr: 4-Bromofluorobenzene	97.7	70.7-125		%REC	217463	1	12/21/2015 17:04	CH
Surr: Dibromofluoromethane	96.2	82.2-120		%REC	217463	1	12/21/2015 17:04	CH
Surr: Toluene-d8	100	81.8-120		%REC	217463	1	12/21/2015 17:04	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-27-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:08:00 AM
Lab ID:	1512F66-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 17:28	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 17:28	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 17:28	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 17:28	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 17:28	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 17:28	CH
cis-1,2-Dichloroethene	8.0	5.0		ug/L	217463	1	12/21/2015 17:28	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 17:28	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 17:28	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-27-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:08:00 AM
Lab ID:	1512F66-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Trichloroethene	8.1	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:28	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 17:28	CH
Surr: 4-Bromofluorobenzene	97	70.7-125		%REC	217463	1	12/21/2015 17:28	CH
Surr: Dibromofluoromethane	94.8	82.2-120		%REC	217463	1	12/21/2015 17:28	CH
Surr: Toluene-d8	100	81.8-120		%REC	217463	1	12/21/2015 17:28	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-39-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:20:00 AM
Lab ID:	1512F66-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 17:52	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 17:52	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 17:52	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 17:52	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 17:52	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 17:52	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 17:52	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 17:52	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-39-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:20:00 AM
Lab ID:	1512F66-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Trichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 17:52	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 17:52	CH
Surr: 4-Bromofluorobenzene	97.9	70.7-125		%REC	217463	1	12/21/2015 17:52	CH
Surr: Dibromofluoromethane	98.3	82.2-120		%REC	217463	1	12/21/2015 17:52	CH
Surr: Toluene-d8	99.8	81.8-120		%REC	217463	1	12/21/2015 17:52	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-28-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:35:00 AM
Lab ID:	1512F66-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 18:16	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 18:16	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 18:16	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 18:16	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 18:16	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 18:16	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 18:16	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 18:16	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-MW-28-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:35:00 AM
Lab ID:	1512F66-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Trichloroethene	79	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:16	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 18:16	CH
Surr: 4-Bromofluorobenzene	99	70.7-125		%REC	217463	1	12/21/2015 18:16	CH
Surr: Dibromofluoromethane	98	82.2-120		%REC	217463	1	12/21/2015 18:16	CH
Surr: Toluene-d8	101	81.8-120		%REC	217463	1	12/21/2015 18:16	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-BLANK-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:46:00 AM
Lab ID:	1512F66-008	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 18:39	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 18:39	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 18:39	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 18:39	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 18:39	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 18:39	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 18:39	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 18:39	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-BLANK-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 9:46:00 AM
Lab ID:	1512F66-008	**Matrix:**	Aqueous

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Trichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 18:39	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 18:39	CH
Surr: 4-Bromofluorobenzene	98.4	70.7-125		%REC	217463	1	12/21/2015 18:39	CH
Surr: Dibromofluoromethane	98.5	82.2-120		%REC	217463	1	12/21/2015 18:39	CH
Surr: Toluene-d8	101	81.8-120		%REC	217463	1	12/21/2015 18:39	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-DUP-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 12:00:00 PM
Lab ID:	1512F66-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,1-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,1-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,2-Dibromoethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,2-Dichloroethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,2-Dichloropropane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
2-Butanone	BRL	50		ug/L	217463	1	12/21/2015 19:03	CH
2-Hexanone	BRL	10		ug/L	217463	1	12/21/2015 19:03	CH
4-Methyl-2-pentanone	BRL	10		ug/L	217463	1	12/21/2015 19:03	CH
Acetone	BRL	50		ug/L	217463	1	12/21/2015 19:03	CH
Benzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Bromodichloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Bromoform	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Bromomethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Carbon disulfide	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Carbon tetrachloride	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Chlorobenzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Chloroethane	BRL	10		ug/L	217463	1	12/21/2015 19:03	CH
Chloroform	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Chloromethane	BRL	10		ug/L	217463	1	12/21/2015 19:03	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Cyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Dibromochloromethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Dichlorodifluoromethane	BRL	10		ug/L	217463	1	12/21/2015 19:03	CH
Ethylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Freon-113	BRL	10		ug/L	217463	1	12/21/2015 19:03	CH
Isopropylbenzene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
m,p-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Methyl acetate	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Methylcyclohexane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Methylene chloride	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
o-Xylene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 22-Dec-15

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	15350-DUP-P
Project Name:	Rheem	**Collection Date:**	12/16/2015 12:00:00 PM
Lab ID:	1512F66-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Tetrachloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Toluene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Trichloroethene	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Trichlorofluoromethane	BRL	5.0		ug/L	217463	1	12/21/2015 19:03	CH
Vinyl chloride	BRL	2.0		ug/L	217463	1	12/21/2015 19:03	CH
Surr: 4-Bromofluorobenzene	99.5	70.7-125		%REC	217463	1	12/21/2015 19:03	CH
Surr: Dibromofluoromethane	97	82.2-120		%REC	217463	1	12/21/2015 19:03	CH
Surr: Toluene-d8	101	81.8-120		%REC	217463	1	12/21/2015 19:03	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client ERS Work Order Number 1512F66

Checklist completed by _____ 12/16/15
Signature Date

Carrier name: FedEx __ UPS __ Courier __ Client ✓ US Mail __ Other _____

Shipping container/cooler in good condition? Yes ✓ No __ Not Present __

Custody seals intact on shipping container/cooler? Yes __ No __ Not Present ✓

Custody seals intact on sample bottles? Yes __ No __ Not Present ✓

Container/Temp Blank temperature in compliance? (0°≤6°C)* Yes ✓ No __

Cooler #1 3.4 Cooler #2 _____ Cooler #3 _____ Cooler #4 _____ Cooler#5 _____ Cooler #6 _____

Chain of custody present? Yes ✓ No __

Chain of custody signed when relinquished and received? Yes ✓ No __

Chain of custody agrees with sample labels? Yes ✓ No __

Samples in proper container/bottle? Yes ✓ No __

Sample containers intact? Yes ✓ No __

Sufficient sample volume for indicated test? Yes ✓ No __

All samples received within holding time? Yes ✓ No __

Was TAT marked on the COC? Yes ✓ No __

Proceed with Standard TAT as per project history? Yes __ No __ Not Applicable ✓

Water - VOA vials have zero headspace? No VOA vials submitted __ Yes ✓ No __

Water - pH acceptable upon receipt? Yes ✓ No __ Not Applicable __

Adjusted? _____ Checked by _____

Sample Condition: Good ✓ Other(Explain) _____

(For diffusive samples or AIHA lead) Is a known blank included? Yes __ No ✓

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\\Aes_server\I\Sample Receipt\My Documents\COCs and pH Adjustment Sheet\Sample_Cooler_Recipt_Checklist_Rev1.rtf

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1512F66

ANALYTICAL QC SUMMARY REPORT

BatchID: 217463

Sample ID: **MB-217463** Client ID: Units: **ug/L** Prep Date: **12/21/2015** Run No: **306847**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **217463** Analysis Date: **12/21/2015** Seq No: **6581962**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	5.0									
1,1,2,2-Tetrachloroethane	BRL	5.0									
1,1,2-Trichloroethane	BRL	5.0									
1,1-Dichloroethane	BRL	5.0									
1,1-Dichloroethene	BRL	5.0									
1,2,4-Trichlorobenzene	BRL	5.0									
1,2-Dibromo-3-chloropropane	BRL	5.0									
1,2-Dibromoethane	BRL	5.0									
1,2-Dichlorobenzene	BRL	5.0									
1,2-Dichloroethane	BRL	5.0									
1,2-Dichloropropane	BRL	5.0									
1,3-Dichlorobenzene	BRL	5.0									
1,4-Dichlorobenzene	BRL	5.0									
2-Butanone	BRL	50									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	50									
Benzene	BRL	5.0									
Bromodichloromethane	BRL	5.0									
Bromoform	BRL	5.0									
Bromomethane	BRL	5.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	5.0									
Chlorobenzene	BRL	5.0									
Chloroethane	BRL	10									
Chloroform	BRL	5.0									
Chloromethane	BRL	10									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1512F66

ANALYTICAL QC SUMMARY REPORT

BatchID: 217463

Sample ID: **MB-217463** Client ID: Units: **ug/L** Prep Date: **12/21/2015** Run No: **306847**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **217463** Analysis Date: **12/21/2015** Seq No: **6581962**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	5.0									
cis-1,3-Dichloropropene	BRL	5.0									
Cyclohexane	BRL	5.0									
Dibromochloromethane	BRL	5.0									
Dichlorodifluoromethane	BRL	10									
Ethylbenzene	BRL	5.0									
Freon-113	BRL	10									
Isopropylbenzene	BRL	5.0									
m,p-Xylene	BRL	5.0									
Methyl acetate	BRL	5.0									
Methyl tert-butyl ether	BRL	5.0									
Methylcyclohexane	BRL	5.0									
Methylene chloride	BRL	5.0									
o-Xylene	BRL	5.0									
Styrene	BRL	5.0									
Tetrachloroethene	BRL	5.0									
Toluene	BRL	5.0									
trans-1,2-Dichloroethene	BRL	5.0									
trans-1,3-Dichloropropene	BRL	5.0									
Trichloroethene	BRL	5.0									
Trichlorofluoromethane	BRL	5.0									
Vinyl chloride	BRL	2.0									
Surr: 4-Bromofluorobenzene	50.30	0	50.00		101	70.7	125				
Surr: Dibromofluoromethane	49.47	0	50.00		98.9	82.2	120				
Surr: Toluene-d8	50.87	0	50.00		102	81.8	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1512F66

ANALYTICAL QC SUMMARY REPORT

BatchID: 217463

Sample ID: **LCS-217463** Client ID: Units: **ug/L** Prep Date: **12/21/2015** Run No: **306847**
SampleType: **LCS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **217463** Analysis Date: **12/21/2015** Seq No: **6581961**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	61.48	5.0	50.00		123	64.2	137				
Benzene	54.18	5.0	50.00		108	72.8	128				
Chlorobenzene	54.67	5.0	50.00		109	72.3	126				
Toluene	53.44	5.0	50.00		107	74.9	127				
Trichloroethene	55.94	5.0	50.00		112	70.5	134				
Surr: 4-Bromofluorobenzene	50.59	0	50.00		101	70.7	125				
Surr: Dibromofluoromethane	48.52	0	50.00		97.0	82.2	120				
Surr: Toluene-d8	49.89	0	50.00		99.8	81.8	120				

Sample ID: **1512E69-001AMS** Client ID: Units: **ug/L** Prep Date: **12/21/2015** Run No: **306847**
SampleType: **MS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **217463** Analysis Date: **12/21/2015** Seq No: **6581969**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	57.38	5.0	50.00		115	60.5	156				
Benzene	57.92	5.0	50.00		116	70	135				
Chlorobenzene	57.38	5.0	50.00		115	70.5	132				
Toluene	57.50	5.0	50.00		115	70.5	137				
Trichloroethene	58.29	5.0	50.00		117	71.8	139				
Surr: 4-Bromofluorobenzene	48.50	0	50.00		97.0	70.7	125				
Surr: Dibromofluoromethane	47.61	0	50.00		95.2	82.2	120				
Surr: Toluene-d8	50.20	0	50.00		100	81.8	120				

Sample ID: **1512E69-001AMSD** Client ID: Units: **ug/L** Prep Date: **12/21/2015** Run No: **306847**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **217463** Analysis Date: **12/21/2015** Seq No: **6581970**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	63.67	5.0	50.00		127	60.5	156	57.38	10.4	20	
Benzene	58.31	5.0	50.00		117	70	135	57.92	0.671	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1512F66

ANALYTICAL QC SUMMARY REPORT

BatchID: 217463

Sample ID: **1512E69-001AMSD** Client ID:
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B**
Units: **ug/L** Prep Date: **12/21/2015** Run No: **306847**
BatchID: **217463** Analysis Date: **12/21/2015** Seq No: **6581970**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	55.97	5.0	50.00		112	70.5	132	57.38	2.49	20	
Toluene	55.99	5.0	50.00		112	70.5	137	57.50	2.66	20	
Trichloroethene	57.23	5.0	50.00		114	71.8	139	58.29	1.84	20	
Surr: 4-Bromofluorobenzene	49.86	0	50.00		99.7	70.7	125	48.50	0	0	
Surr: Dibromofluoromethane	48.50	0	50.00		97.0	82.2	120	47.61	0	0	
Surr: Toluene-d8	50.43	0	50.00		101	81.8	120	50.20	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

March 07, 2016

Justin Vickery
Environmental Planning Specialists, Inc.
1050 Crown Pointe Parkway
Atlanta GA 30338

TEL: (404) 315-9113
FAX: (404) 315-8509

RE: Rheem

Dear Justin Vickery: Order No: 1602P56

Analytical Environmental Services, Inc. received 2 samples on 2/26/2016 6:10:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAC/Florida State Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, and Drinking Water Microbiology, effective 07/01/15-06/30/16.
-NELAC/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/15-06/30/16.
-NELAC/Texas Certificate No. T104704509-16-6 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 03/01/16-02/28/17.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/17.

CKKanhai

Chantelle Kanhai
Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive, Atlanta GA 30340-3704
AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 160256

Date: 2-26-16 Page 1 of 1

COMPANY:	ADDRESS:
EPS Inc	1050 Crown Pointe Pkwy Ste. 550 Atlanta, GA 30338
PHONE: 404 315 9113	FAX:
SAMPLED BY: Alex Testoff	SIGNATURE: Alex Testoff

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	TCLP Metals (PRESERVATION I)	TCLP-VOCs (PRESERVATION I)	VOCs (PRESERVATION H+I)	No # of Containers	REMARKS
1	16057-TCLP	2-26-16	13:25		X	SO	X	X		1	
2	16057-MW-54	2-26-16	15:27	X		GW			X	2	
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											

ANALYSIS REQUESTED

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: Alex Testoff	2-26-16 18:10	1: [signature]	2-26-16 18:10
2:		2:	
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: Rheem
PROJECT #:
SITE ADDRESS: Milledgeville, GA
SEND REPORT TO: jvickery@cpwplanning.com & atestoff@cpwplanning.com
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 3

Turnaround Time Request
- (●) Standard 5 Business Days
- ( ) 2 Business Day Rush
- ( ) Next Business Day Rush
- ( ) Same Day Rush (auth req.)
- ( ) Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES.
SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water
PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc **Date:** 7-Mar-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16057-TCLP
Project Name:	Rheem	**Collection Date:**	2/26/2016 1:25:00 PM
Lab ID:	1602P56-001	**Matrix:**	Soil

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
VOLATILES, TCLP SW1311/8260B				**(SW5030B)**				
1,1-Dichloroethene	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
1,2-Dichloroethane	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
2-Butanone	BRL	0.20		mg/L	220546	20	03/01/2016 17:24	MD
Benzene	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
Carbon tetrachloride	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
Chlorobenzene	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
Chloroform	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
Tetrachloroethene	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
Trichloroethene	BRL	0.10		mg/L	220546	20	03/01/2016 17:24	MD
Vinyl chloride	BRL	0.040		mg/L	220546	20	03/01/2016 17:24	MD
Surr: 4-Bromofluorobenzene	88.2	64-125		%REC	220546	20	03/01/2016 17:24	MD
Surr: Dibromofluoromethane	92.6	73.7-128		%REC	220546	20	03/01/2016 17:24	MD
Surr: Toluene-d8	95	78.9-120		%REC	220546	20	03/01/2016 17:24	MD
MERCURY, TCLP SW1311/7470A				**(SW7470A)**				
Mercury	BRL	0.00400		mg/L	220650	1	03/03/2016 13:35	MC
ICP METALS, TCLP SW1311/6010C				**(SW3010A)**				
Arsenic	BRL	0.250		mg/L	220671	1	03/04/2016 00:16	IO
Barium	1.26	0.500		mg/L	220671	1	03/04/2016 00:16	IO
Cadmium	BRL	0.0250		mg/L	220671	1	03/04/2016 00:16	IO
Chromium	BRL	0.0500		mg/L	220671	1	03/04/2016 00:16	IO
Lead	BRL	0.0500		mg/L	220671	1	03/04/2016 00:16	IO
Selenium	BRL	0.100		mg/L	220671	1	03/04/2016 00:16	IO
Silver	BRL	0.0250		mg/L	220671	1	03/04/2016 00:16	IO

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 7-Mar-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16057-MW-54
Project Name:	Rheem	**Collection Date:**	2/26/2016 3:27:00 PM
Lab ID:	1602P56-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,1-Dichloroethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,1-Dichloroethene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,2-Dibromoethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,2-Dichloroethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,2-Dichloropropane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
2-Butanone	BRL	50		ug/L	220711	1	03/04/2016 12:02	NP
2-Hexanone	BRL	10		ug/L	220711	1	03/04/2016 12:02	NP
4-Methyl-2-pentanone	BRL	10		ug/L	220711	1	03/04/2016 12:02	NP
Acetone	BRL	50		ug/L	220711	1	03/04/2016 12:02	NP
Benzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Bromodichloromethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Bromoform	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Bromomethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Carbon disulfide	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Carbon tetrachloride	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Chlorobenzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Chloroethane	BRL	10		ug/L	220711	1	03/04/2016 12:02	NP
Chloroform	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Chloromethane	BRL	10		ug/L	220711	1	03/04/2016 12:02	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Cyclohexane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Dibromochloromethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Dichlorodifluoromethane	BRL	10		ug/L	220711	1	03/04/2016 12:02	NP
Ethylbenzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Freon-113	BRL	10		ug/L	220711	1	03/04/2016 12:02	NP
Isopropylbenzene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
m,p-Xylene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Methyl acetate	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Methylcyclohexane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Methylene chloride	8.3	5.0		ug/L	220711	1	03/04/2016 12:02	NP
o-Xylene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 7-Mar-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16057-MW-54
Project Name:	Rheem	**Collection Date:**	2/26/2016 3:27:00 PM
Lab ID:	1602P56-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Tetrachloroethene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Toluene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Trichloroethene	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Trichlorofluoromethane	BRL	5.0		ug/L	220711	1	03/04/2016 12:02	NP
Vinyl chloride	BRL	2.0		ug/L	220711	1	03/04/2016 12:02	NP
Surr: 4-Bromofluorobenzene	92.6	70.7-125		%REC	220711	1	03/04/2016 12:02	NP
Surr: Dibromofluoromethane	105	82.2-120		%REC	220711	1	03/04/2016 12:02	NP
Surr: Toluene-d8	97.1	81.8-120		%REC	220711	1	03/04/2016 12:02	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client EPS Work Order Number 1602P56

Checklist completed by [signature] 2/26/16
Signature Date

Carrier name: FedEx __ UPS __ Courier __ Client ✓ US Mail __ Other _____

Shipping container/cooler in good condition? Yes ✓ No __ Not Present __

Custody seals intact on shipping container/cooler? Yes __ No __ Not Present ✓

Custody seals intact on sample bottles? Yes __ No __ Not Present ✓

Container/Temp Blank temperature in compliance? (0°≤6°C)* Yes ✓ No __

Cooler #1 2.4°C Cooler #2 _____ Cooler #3 _____ Cooler #4 _____ Cooler#5 _____ Cooler #6 _____

Chain of custody present? Yes ✓ No __

Chain of custody signed when relinquished and received? Yes ✓ No __

Chain of custody agrees with sample labels? Yes ✓ No __

Samples in proper container/bottle? Yes ✓ No __

Sample containers intact? Yes ✓ No __

Sufficient sample volume for indicated test? Yes ✓ No __

All samples received within holding time? Yes ✓ No __

Was TAT marked on the COC? Yes ✓ No __

Proceed with Standard TAT as per project history? Yes __ No __ Not Applicable ✓

Water - VOA vials have zero headspace? No VOA vials submitted __ Yes ✓ No __

Water - pH acceptable upon receipt? Yes ✓ No __ Not Applicable __

Adjusted? _____ Checked by _____

Sample Condition: Good ✓ Other(Explain) _____

(For diffusive samples or AIHA lead) Is a known blank included? Yes __ No ✓

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\\Aes_server\I\Sample Receipt\My Documents\COCs and pH Adjustment Sheet\Sample_Cooler_Recipt_Checklist_Rev1.rtf

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220546

Sample ID: **MB-220546** Client ID: Units: **mg/L** Prep Date: **03/01/2016** Run No: **311509**
SampleType: **MBLK** TestCode: **VOLATILES, TCLP SW1311/8260B** BatchID: **220546** Analysis Date: **03/01/2016** Seq No: **6694049**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	BRL	0.10									
1,2-Dichloroethane	BRL	0.10									
2-Butanone	BRL	0.20									
Benzene	BRL	0.10									
Carbon tetrachloride	BRL	0.10									
Chlorobenzene	BRL	0.10									
Chloroform	BRL	0.10									
Tetrachloroethene	BRL	0.10									
Trichloroethene	BRL	0.10									
Vinyl chloride	BRL	0.040									
Surr: 4-Bromofluorobenzene	0.9272	0	1.000		92.7	64	125				
Surr: Dibromofluoromethane	0.9378	0	1.000		93.8	73.7	128				
Surr: Toluene-d8	0.9428	0	1.000		94.3	78.9	120				

Sample ID: **LCS-220546** Client ID: Units: **mg/L** Prep Date: **03/01/2016** Run No: **311509**
SampleType: **LCS** TestCode: **VOLATILES, TCLP SW1311/8260B** BatchID: **220546** Analysis Date: **03/01/2016** Seq No: **6694047**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.9644	0.10	1.000		96.4	58	134				
1,2-Dichloroethane	1.061	0.10	1.000		106	65	133				
2-Butanone	1.462	0.20	2.000		73.1	47.2	141				
Benzene	1.118	0.10	1.000		112	74.1	126				
Carbon tetrachloride	1.049	0.10	1.000		105	68.7	145				
Chlorobenzene	1.088	0.10	1.000		109	77.6	124				
Chloroform	1.048	0.10	1.000		105	66.9	123				
Tetrachloroethene	1.215	0.10	1.000		122	72.7	134				
Trichloroethene	1.108	0.10	1.000		111	77.1	129				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220546

Sample ID: **LCS-220546**	Client ID:			Units: **mg/L**		Prep Date: **03/01/2016**		Run No: **311509**
SampleType: **LCS**	TestCode: **VOLATILES, TCLP SW1311/8260B**			BatchID: **220546**		Analysis Date: **03/01/2016**		Seq No: **6694047**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Vinyl chloride	1.117	0.040	1.000		112	54.3	136				
Surr: 4-Bromofluorobenzene	1.032	0	1.000		103	64	125				
Surr: Dibromofluoromethane	0.9196	0	1.000		92.0	73.7	128				
Surr: Toluene-d8	1.012	0	1.000		101	78.9	120				

Sample ID: **1602P19-001AMS**	Client ID:			Units: **mg/L**		Prep Date: **03/01/2016**		Run No: **311509**
SampleType: **MS**	TestCode: **VOLATILES, TCLP SW1311/8260B**			BatchID: **220546**		Analysis Date: **03/01/2016**		Seq No: **6694453**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.9356	0.10	1.000		93.6	62.5	139				
1,2-Dichloroethane	0.8616	0.10	1.000		86.2	65.4	135				
2-Butanone	1.391	0.20	2.000		69.5	50.4	144				
Benzene	1.078	0.10	1.000		108	71.3	134				
Carbon tetrachloride	0.9486	0.10	1.000		94.9	70.7	143				
Chlorobenzene	0.9740	0.10	1.000		97.4	74.5	129				
Chloroform	0.9860	0.10	1.000		98.6	64.4	131				
Tetrachloroethene	0.9970	0.10	1.000		99.7	75.1	136				
Trichloroethene	1.043	0.10	1.000		104	75.3	137				
Vinyl chloride	0.9968	0.040	1.000		99.7	50.1	143				
Surr: 4-Bromofluorobenzene	1.004	0	1.000		100	64	125				
Surr: Dibromofluoromethane	0.9514	0	1.000		95.1	73.7	128				
Surr: Toluene-d8	0.9916	0	1.000		99.2	78.9	120				

Sample ID: **1602P19-001ADUP**	Client ID:			Units: **mg/L**		Prep Date: **03/01/2016**		Run No: **311509**
SampleType: **DUP**	TestCode: **VOLATILES, TCLP SW1311/8260B**			BatchID: **220546**		Analysis Date: **03/01/2016**		Seq No: **6694454**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	BRL	0.10						0	0	30	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220546

Sample ID: **1602P19-001ADUP** Client ID: Units: **mg/L** Prep Date: **03/01/2016** Run No: **311509**
SampleType: **DUP** TestCode: **VOLATILES, TCLP SW1311/8260B** BatchID: **220546** Analysis Date: **03/01/2016** Seq No: **6694454**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,2-Dichloroethane	BRL	0.10						0	0	30	
2-Butanone	BRL	0.20						0	0	30	
Benzene	BRL	0.10						0	0	30	
Carbon tetrachloride	BRL	0.10						0	0	30	
Chlorobenzene	BRL	0.10						0	0	30	
Chloroform	BRL	0.10						0	0	30	
Tetrachloroethene	BRL	0.10						0	0	30	
Trichloroethene	BRL	0.10						0	0	30	
Vinyl chloride	BRL	0.040						0	0	30	
Surr: 4-Bromofluorobenzene	0.9168	0	1.000		91.7	64	125	0.8984	0	0	
Surr: Dibromofluoromethane	0.8742	0	1.000		87.4	73.7	128	0.8636	0	0	
Surr: Toluene-d8	0.9530	0	1.000		95.3	78.9	120	0.9286	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220650

Sample ID: **MB-220650**	Client ID:				Units: **mg/L**		Prep Date: **03/03/2016**		Run No: **311697**
SampleType: **MBLK**	TestCode: **MERCURY, TCLP SW1311/7470A**				BatchID: **220650**		Analysis Date: **03/03/2016**		Seq No: **6698784**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	BRL	0.00400									

Sample ID: **LCS-220650**	Client ID:				Units: **mg/L**		Prep Date: **03/03/2016**		Run No: **311697**
SampleType: **LCS**	TestCode: **MERCURY, TCLP SW1311/7470A**				BatchID: **220650**		Analysis Date: **03/03/2016**		Seq No: **6698785**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	0.03749	0.00400	0.0400		93.7	80	120				

Sample ID: **1602P90-001CMS**	Client ID:				Units: **mg/L**		Prep Date: **03/03/2016**		Run No: **311697**
SampleType: **MS**	TestCode: **MERCURY, TCLP SW1311/7470A**				BatchID: **220650**		Analysis Date: **03/03/2016**		Seq No: **6698787**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	0.03808	0.00400	0.0400		95.2	80	120				

Sample ID: **1602P90-001CMSD**	Client ID:				Units: **mg/L**		Prep Date: **03/03/2016**		Run No: **311697**
SampleType: **MSD**	TestCode: **MERCURY, TCLP SW1311/7470A**				BatchID: **220650**		Analysis Date: **03/03/2016**		Seq No: **6698788**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Mercury	0.03791	0.00400	0.0400		94.8	80	120	0.03808	0.464	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220671

Sample ID: **MB-220671** Client ID: Units: **mg/L** Prep Date: **03/03/2016** Run No: **311763**
SampleType: **MBLK** TestCode: **ICP METALS, TCLP SW1311/6010C** BatchID: **220671** Analysis Date: **03/03/2016** Seq No: **6700506**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	BRL	0.250									
Barium	BRL	0.500									
Cadmium	BRL	0.0250									
Chromium	BRL	0.0500									
Lead	BRL	0.0500									
Selenium	BRL	0.100									
Silver	BRL	0.0250									

Sample ID: **LCS-220671** Client ID: Units: **mg/L** Prep Date: **03/03/2016** Run No: **311763**
SampleType: **LCS** TestCode: **ICP METALS, TCLP SW1311/6010C** BatchID: **220671** Analysis Date: **03/03/2016** Seq No: **6700507**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	4.942	0.250	5.000		98.8	80	120				
Barium	4.743	0.500	5.000	0.02292	94.4	80	120				
Cadmium	4.909	0.0250	5.000		98.2	80	120				
Chromium	4.856	0.0500	5.000		97.1	80	120				
Lead	4.728	0.0500	5.000		94.6	80	120				
Selenium	5.079	0.100	5.000		102	80	120				
Silver	0.4847	0.0250	0.5000		96.9	80	120				

Sample ID: **1602P66-001BMS** Client ID: Units: **mg/L** Prep Date: **03/03/2016** Run No: **311763**
SampleType: **MS** TestCode: **ICP METALS, TCLP SW1311/6010C** BatchID: **220671** Analysis Date: **03/03/2016** Seq No: **6700510**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	5.039	0.250	5.000		101	50	150				
Barium	4.810	0.500	5.000	0.03809	95.4	50	150				
Cadmium	4.956	0.0250	5.000		99.1	50	150				
Chromium	4.907	0.0500	5.000		98.1	50	150				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220671

Sample ID: **1602P66-001BMS** Client ID:
SampleType: **MS** TestCode: **ICP METALS, TCLP SW1311/6010C**
Units: **mg/L** Prep Date: **03/03/2016** Run No: **311763**
BatchID: **220671** Analysis Date: **03/03/2016** Seq No: **6700510**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Lead	4.769	0.0500	5.000		95.4	50	150				
Selenium	5.192	0.100	5.000	0.08245	102	50	150				
Silver	0.4925	0.0250	0.5000		98.5	50	150				

Sample ID: **1602P66-001BMSD** Client ID:
SampleType: **MSD** TestCode: **ICP METALS, TCLP SW1311/6010C**
Units: **mg/L** Prep Date: **03/03/2016** Run No: **311763**
BatchID: **220671** Analysis Date: **03/03/2016** Seq No: **6700511**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	5.146	0.250	5.000		103	50	150	5.039	2.11	30	
Barium	4.866	0.500	5.000	0.03809	96.5	50	150	4.810	1.14	30	
Cadmium	5.008	0.0250	5.000		100	50	150	4.956	1.05	30	
Chromium	4.965	0.0500	5.000		99.3	50	150	4.907	1.18	30	
Lead	4.815	0.0500	5.000		96.3	50	150	4.769	0.949	30	
Selenium	5.382	0.100	5.000	0.08245	106	50	150	5.192	3.59	30	
Silver	0.4981	0.0250	0.5000		99.6	50	150	0.4925	1.12	30	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220711

Sample ID: **MB-220711**	Client ID:		Units: **ug/L**	Prep Date: **03/03/2016**	Run No: **311745**
SampleType: **MBLK**	TestCode: **TCL VOLATILE ORGANICS SW8260B**		BatchID: **220711**	Analysis Date: **03/03/2016**	Seq No: **6699936**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	5.0									
1,1,2,2-Tetrachloroethane	BRL	5.0									
1,1,2-Trichloroethane	BRL	5.0									
1,1-Dichloroethane	BRL	5.0									
1,1-Dichloroethene	BRL	5.0									
1,2,4-Trichlorobenzene	BRL	5.0									
1,2-Dibromo-3-chloropropane	BRL	5.0									
1,2-Dibromoethane	BRL	5.0									
1,2-Dichlorobenzene	BRL	5.0									
1,2-Dichloroethane	BRL	5.0									
1,2-Dichloropropane	BRL	5.0									
1,3-Dichlorobenzene	BRL	5.0									
1,4-Dichlorobenzene	BRL	5.0									
2-Butanone	BRL	50									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	50									
Benzene	BRL	5.0									
Bromodichloromethane	BRL	5.0									
Bromoform	BRL	5.0									
Bromomethane	BRL	5.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	5.0									
Chlorobenzene	BRL	5.0									
Chloroethane	BRL	10									
Chloroform	BRL	5.0									
Chloromethane	BRL	10									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220711

Sample ID: **MB-220711** Client ID: Units: **ug/L** Prep Date: **03/03/2016** Run No: **311745**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **220711** Analysis Date: **03/03/2016** Seq No: **6699936**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	5.0									
cis-1,3-Dichloropropene	BRL	5.0									
Cyclohexane	BRL	5.0									
Dibromochloromethane	BRL	5.0									
Dichlorodifluoromethane	BRL	10									
Ethylbenzene	BRL	5.0									
Freon-113	BRL	10									
Isopropylbenzene	BRL	5.0									
m,p-Xylene	BRL	5.0									
Methyl acetate	BRL	5.0									
Methyl tert-butyl ether	BRL	5.0									
Methylcyclohexane	BRL	5.0									
Methylene chloride	BRL	5.0									
o-Xylene	BRL	5.0									
Styrene	BRL	5.0									
Tetrachloroethene	BRL	5.0									
Toluene	BRL	5.0									
trans-1,2-Dichloroethene	BRL	5.0									
trans-1,3-Dichloropropene	BRL	5.0									
Trichloroethene	BRL	5.0									
Trichlorofluoromethane	BRL	5.0									
Vinyl chloride	BRL	2.0									
Surr: 4-Bromofluorobenzene	40.68	0	50.00		81.4	70.7	125				
Surr: Dibromofluoromethane	56.12	0	50.00		112	82.2	120				
Surr: Toluene-d8	48.36	0	50.00		96.7	81.8	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220711

Sample ID: **LCS-220711** Client ID: Units: **ug/L** Prep Date: **03/03/2016** Run No: **311745**
SampleType: **LCS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **220711** Analysis Date: **03/03/2016** Seq No: **6699935**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	59.07	5.0	50.00		118	65.3	137				
Benzene	50.79	5.0	50.00		102	74.9	123				
Chlorobenzene	53.65	5.0	50.00		107	73.9	124				
Toluene	52.02	5.0	50.00		104	75	124				
Trichloroethene	57.89	5.0	50.00		116	73.1	128				
Surr: 4-Bromofluorobenzene	42.25	0	50.00		84.5	70.7	125				
Surr: Dibromofluoromethane	53.52	0	50.00		107	82.2	120				
Surr: Toluene-d8	48.17	0	50.00		96.3	81.8	120				

Sample ID: **1602P55-001AMS** Client ID: Units: **ug/L** Prep Date: **03/03/2016** Run No: **311745**
SampleType: **MS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **220711** Analysis Date: **03/04/2016** Seq No: **6699950**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	6183	500	5000		124	60	150				
Benzene	5065	500	5000		101	70.1	132				
Chlorobenzene	5312	500	5000		106	70.9	131				
Toluene	5473	500	5000		109	70.1	133				
Trichloroethene	17250	500	5000	10140	142	70	136				S
Surr: 4-Bromofluorobenzene	4507	0	5000		90.1	70.7	125				
Surr: Dibromofluoromethane	5454	0	5000		109	82.2	120				
Surr: Toluene-d8	5177	0	5000		104	81.8	120				

Sample ID: **1602P55-001AMSD** Client ID: Units: **ug/L** Prep Date: **03/03/2016** Run No: **311745**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **220711** Analysis Date: **03/04/2016** Seq No: **6699953**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	5856	500	5000		117	60	150	6183	5.43	17.7	
Benzene	5062	500	5000		101	70.1	132	5065	0.059	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1602P56

ANALYTICAL QC SUMMARY REPORT

BatchID: 220711

Sample ID: **1602P55-001AMSD** Client ID:
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B**
Units: **ug/L** Prep Date: **03/03/2016** Run No: **311745**
BatchID: **220711** Analysis Date: **03/04/2016** Seq No: **6699953**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	5330	500	5000		107	70.9	131	5312	0.338	20	
Toluene	5237	500	5000		105	70.1	133	5473	4.41	20	
Trichloroethene	17110	500	5000	10140	139	70	136	17250	0.815	20	S
Surr: 4-Bromofluorobenzene	4069	0	5000		81.4	70.7	125	4507	0	0	
Surr: Dibromofluoromethane	5523	0	5000		110	82.2	120	5454	0	0	
Surr: Toluene-d8	4975	0	5000		99.5	81.8	120	5177	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

May 05, 2016

Justin Vickery
Environmental Planning Specialists, Inc.
1050 Crown Pointe Parkway
Atlanta GA 30338

TEL: (404) 315-9113
FAX: (404) 315-8509

RE: Rheem

Dear Justin Vickery: Order No: 1604P26

Analytical Environmental Services, Inc. received 11 samples on 4/29/2016 2:00:00 PM for the analyses presented in following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative.
AES's accreditations are as follows:
-NELAC/Florida State Laboratory ID E87582 for analysis of Non-Potable Water, Solid & Chemical Materials, and Drinking Water Microbiology, effective 07/01/15-06/30/16.
-NELAC/Louisiana Agency Interest No. 100818 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 07/01/15-06/30/16.
-NELAC/Texas Certificate No. T104704509-16-6 for or analysis of Non-Potable Water and Solid & Chemical Materials, effective 03/01/16-02/28/17.
-AIHA-LAP, LLC Laboratory ID: 100671 for Industrial Hygiene samples (Organics, Inorganics), Environmental Lead (Paint, Soil, Dust Wipes, Air), and Environmental Microbiology (Fungal) Direct Examination, effective until 09/01/17.

Chantelle Kanhai
Project Manager

ANALYTICAL ENVIRONMENTAL SERVICES, INC
3080 Presidential Drive, Atlanta GA 30340-3704
AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY

Work Order: 1604P26

Date: 4-29-16 Page 1 of 1

COMPANY:	ADDRESS:
EPS Inc.	1050 Crown Pointe Pkwy Ste 550 Atlanta, GA 30338
PHONE: 404 315 9113	FAX:
SAMPLED BY: Alex Testoff / Brian Goldman	SIGNATURE: Alex Testoff / B. Goldman

#	SAMPLE ID	SAMPLED DATE	SAMPLED TIME	Grab	Composite	Matrix (See codes)	PRESERVATION (See codes) H+I	ANALYSIS REQUESTED VOCs	REMARKS	No # of Containers
1	16119-MW-33	4-28-16	1742	X		GW	X	X		2
2	16119-MW-34	4-28-16	1125	X			X	X		2
3	16117-MW-35	4-26-16	1755	X			X	X		2
4	16117-MW-36	4-26-16	1150	X			X	X		2
5	16118-MW-43	4-27-16	1535	X			X	X		2
6	16119-MW-44	4-28-16	1502	X			X	X		2
7	16117-MW-45	4-26-16	1600	X			X	X		2
8	16119-MW-46	4-28-16	1055	X			X	X		2
9	16119-MW-47	4-28-16	1437	X			X	X		2
10	16117-MW-54	4-26-16	1325	X			X	X		2
11	16119-DUP	4-28-16	1206	X		GW	X	X		2
12										
13										
14										

Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.

RELINQUISHED BY:	DATE/TIME	RECEIVED BY	DATE/TIME
1: Alex Testoff	4-29-16 14:14	1: Jessica A Hilly	4/29/16 2:00 pm
2:		2:	
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD
OUT / / VIA:
IN / / VIA:
(CLIENT) FedEx UPS MAIL COURIER
GREYHOUND OTHER_____

PROJECT INFORMATION
PROJECT NAME: Rheem
PROJECT #:
SITE ADDRESS: Milledgeville, GA
SEND REPORT TO: jwickey@enviplanning.com & a.testoff@enviplanning.com
INVOICE TO: (IF DIFFERENT FROM ABOVE)
QUOTE #:_____ PO#:_____

RECEIPT
Total # of Containers: 22

Turnaround Time Request
(●) Standard 5 Business Days
( ) 2 Business Day Rush
( ) Next Business Day Rush
( ) Same Day Rush (auth req.)
( ) Other _____

STATE PROGRAM (if any): _____
E-mail? Y / N; Fax? Y / N
DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR ON SATURDAY ARE CONSIDERED RECEIVED THE NEXT BUSINESS DAY. IF TURNAROUND TIME IS NOT INDICATED, AES WILL PROCEED WITH STANDARD TAT OF SAMPLES.
SAMPLES ARE DISPOSED 30 DAYS AFTER REPORT COMPLETION UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water
PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

Analytical Environmental Services, Inc

Date: 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-33
Project Name:	Rheem	**Collection Date:**	4/27/2016 5:42:00 PM
Lab ID:	1604P26-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
2-Butanone	BRL	50		ug/L	223505	1	05/03/2016 04:45	CH
2-Hexanone	BRL	10		ug/L	223505	1	05/03/2016 04:45	CH
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/03/2016 04:45	CH
Acetone	BRL	50		ug/L	223505	1	05/03/2016 04:45	CH
Benzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Bromoform	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Bromomethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Chloroethane	BRL	10		ug/L	223505	1	05/03/2016 04:45	CH
Chloroform	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Chloromethane	BRL	10		ug/L	223505	1	05/03/2016 04:45	CH
cis-1,2-Dichloroethene	31	5.0		ug/L	223505	1	05/03/2016 04:45	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Cyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/03/2016 04:45	CH
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Freon-113	BRL	10		ug/L	223505	1	05/03/2016 04:45	CH
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Methyl acetate	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Methylene chloride	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
o-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-33
Project Name:	Rheem	**Collection Date:**	4/27/2016 5:42:00 PM
Lab ID:	1604P26-001	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Toluene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Trichloroethene	90	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:45	CH
Vinyl chloride	5.4	2.0		ug/L	223505	1	05/03/2016 04:45	CH
Surr: 4-Bromofluorobenzene	87.7	70.7-125		%REC	223505	1	05/03/2016 04:45	CH
Surr: Dibromofluoromethane	102	82.2-120		%REC	223505	1	05/03/2016 04:45	CH
Surr: Toluene-d8	100	81.8-120		%REC	223505	1	05/03/2016 04:45	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-34
Project Name:	Rheem	**Collection Date:**	4/27/2016 11:25:00 AM
Lab ID:	1604P26-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
2-Butanone	BRL	50		ug/L	223505	1	05/03/2016 04:19	CH
2-Hexanone	BRL	10		ug/L	223505	1	05/03/2016 04:19	CH
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/03/2016 04:19	CH
Acetone	BRL	50		ug/L	223505	1	05/03/2016 04:19	CH
Benzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Bromoform	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Bromomethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Chloroethane	BRL	10		ug/L	223505	1	05/03/2016 04:19	CH
Chloroform	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Chloromethane	BRL	10		ug/L	223505	1	05/03/2016 04:19	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Cyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/03/2016 04:19	CH
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Freon-113	BRL	10		ug/L	223505	1	05/03/2016 04:19	CH
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Methyl acetate	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Methylene chloride	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
o-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-34
Project Name:	Rheem	**Collection Date:**	4/27/2016 11:25:00 AM
Lab ID:	1604P26-002	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Toluene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Trichloroethene	60	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/03/2016 04:19	CH
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/03/2016 04:19	CH
Surr: 4-Bromofluorobenzene	88	70.7-125		%REC	223505	1	05/03/2016 04:19	CH
Surr: Dibromofluoromethane	102	82.2-120		%REC	223505	1	05/03/2016 04:19	CH
Surr: Toluene-d8	98.4	81.8-120		%REC	223505	1	05/03/2016 04:19	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-35
Project Name:	Rheem	**Collection Date:**	4/26/2016 5:55:00 PM
Lab ID:	1604P26-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
2-Butanone	BRL	50		ug/L	223505	1	05/03/2016 03:54	CH
2-Hexanone	BRL	10		ug/L	223505	1	05/03/2016 03:54	CH
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/03/2016 03:54	CH
Acetone	BRL	50		ug/L	223505	1	05/03/2016 03:54	CH
Benzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Bromoform	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Bromomethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Chloroethane	BRL	10		ug/L	223505	1	05/03/2016 03:54	CH
Chloroform	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Chloromethane	BRL	10		ug/L	223505	1	05/03/2016 03:54	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Cyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/03/2016 03:54	CH
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Freon-113	BRL	10		ug/L	223505	1	05/03/2016 03:54	CH
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Methyl acetate	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Methylene chloride	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
o-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-35
Project Name:	Rheem	**Collection Date:**	4/26/2016 5:55:00 PM
Lab ID:	1604P26-003	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Toluene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Trichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:54	CH
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/03/2016 03:54	CH
Surr: 4-Bromofluorobenzene	91.4	70.7-125		%REC	223505	1	05/03/2016 03:54	CH
Surr: Dibromofluoromethane	104	82.2-120		%REC	223505	1	05/03/2016 03:54	CH
Surr: Toluene-d8	102	81.8-120		%REC	223505	1	05/03/2016 03:54	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc

Date: 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-36
Project Name:	Rheem	**Collection Date:**	4/26/2016 11:50:00 AM
Lab ID:	1604P26-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
2-Butanone	BRL	50		ug/L	223505	1	05/03/2016 03:28	CH
2-Hexanone	BRL	10		ug/L	223505	1	05/03/2016 03:28	CH
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/03/2016 03:28	CH
Acetone	BRL	50		ug/L	223505	1	05/03/2016 03:28	CH
Benzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Bromoform	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Bromomethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Chloroethane	BRL	10		ug/L	223505	1	05/03/2016 03:28	CH
Chloroform	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Chloromethane	BRL	10		ug/L	223505	1	05/03/2016 03:28	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Cyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/03/2016 03:28	CH
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Freon-113	BRL	10		ug/L	223505	1	05/03/2016 03:28	CH
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Methyl acetate	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Methylene chloride	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
o-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-36
Project Name:	Rheem	**Collection Date:**	4/26/2016 11:50:00 AM
Lab ID:	1604P26-004	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Toluene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Trichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:28	CH
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/03/2016 03:28	CH
Surr: 4-Bromofluorobenzene	89.9	70.7-125		%REC	223505	1	05/03/2016 03:28	CH
Surr: Dibromofluoromethane	101	82.2-120		%REC	223505	1	05/03/2016 03:28	CH
Surr: Toluene-d8	97.3	81.8-120		%REC	223505	1	05/03/2016 03:28	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16118-MW-43
Project Name:	Rheem	**Collection Date:**	4/27/2016 3:35:00 PM
Lab ID:	1604P26-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
2-Butanone	BRL	50		ug/L	223505	1	05/03/2016 03:02	CH
2-Hexanone	BRL	10		ug/L	223505	1	05/03/2016 03:02	CH
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/03/2016 03:02	CH
Acetone	BRL	50		ug/L	223505	1	05/03/2016 03:02	CH
Benzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Bromoform	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Bromomethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Chloroethane	BRL	10		ug/L	223505	1	05/03/2016 03:02	CH
Chloroform	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Chloromethane	BRL	10		ug/L	223505	1	05/03/2016 03:02	CH
cis-1,2-Dichloroethene	7.5	5.0		ug/L	223505	1	05/03/2016 03:02	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Cyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/03/2016 03:02	CH
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Freon-113	BRL	10		ug/L	223505	1	05/03/2016 03:02	CH
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Methyl acetate	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Methylene chloride	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
o-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16118-MW-43
Project Name:	Rheem	**Collection Date:**	4/27/2016 3:35:00 PM
Lab ID:	1604P26-005	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Toluene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Trichloroethene	150	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/03/2016 03:02	CH
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/03/2016 03:02	CH
Surr: 4-Bromofluorobenzene	89.4	70.7-125		%REC	223505	1	05/03/2016 03:02	CH
Surr: Dibromofluoromethane	102	82.2-120		%REC	223505	1	05/03/2016 03:02	CH
Surr: Toluene-d8	99.6	81.8-120		%REC	223505	1	05/03/2016 03:02	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-44
Project Name:	Rheem	**Collection Date:**	4/28/2016 3:02:00 PM
Lab ID:	1604P26-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
2-Butanone	BRL	50		ug/L	223505	1	05/03/2016 01:45	CH
2-Hexanone	BRL	10		ug/L	223505	1	05/03/2016 01:45	CH
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/03/2016 01:45	CH
Acetone	BRL	50		ug/L	223505	1	05/03/2016 01:45	CH
Benzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Bromoform	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Bromomethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Chloroethane	BRL	10		ug/L	223505	1	05/03/2016 01:45	CH
Chloroform	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Chloromethane	BRL	10		ug/L	223505	1	05/03/2016 01:45	CH
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Cyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/03/2016 01:45	CH
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Freon-113	BRL	10		ug/L	223505	1	05/03/2016 01:45	CH
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Methyl acetate	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Methylene chloride	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
o-Xylene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-44
Project Name:	Rheem	**Collection Date:**	4/28/2016 3:02:00 PM
Lab ID:	1604P26-006	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Toluene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Trichloroethene	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/03/2016 01:45	CH
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/03/2016 01:45	CH
Surr: 4-Bromofluorobenzene	90.7	70.7-125		%REC	223505	1	05/03/2016 01:45	CH
Surr: Dibromofluoromethane	94.2	82.2-120		%REC	223505	1	05/03/2016 01:45	CH
Surr: Toluene-d8	94.9	81.8-120		%REC	223505	1	05/03/2016 01:45	CH

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-45
Project Name:	Rheem	**Collection Date:**	4/26/2016 4:00:00 PM
Lab ID:	1604P26-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
2-Butanone	BRL	50		ug/L	223505	1	05/04/2016 18:45	NP
2-Hexanone	BRL	10		ug/L	223505	1	05/04/2016 18:45	NP
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/04/2016 18:45	NP
Acetone	BRL	50		ug/L	223505	1	05/04/2016 18:45	NP
Benzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Bromoform	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Bromomethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Chloroethane	BRL	10		ug/L	223505	1	05/04/2016 18:45	NP
Chloroform	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Chloromethane	BRL	10		ug/L	223505	1	05/04/2016 18:45	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Cyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/04/2016 18:45	NP
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Freon-113	BRL	10		ug/L	223505	1	05/04/2016 18:45	NP
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Methyl acetate	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Methyl tert-butyl ether	5.0	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Methylene chloride	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
o-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-45
Project Name:	Rheem	**Collection Date:**	4/26/2016 4:00:00 PM
Lab ID:	1604P26-007	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Toluene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Trichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/04/2016 18:45	NP
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/04/2016 18:45	NP
Surr: 4-Bromofluorobenzene	89.4	70.7-125		%REC	223505	1	05/04/2016 18:45	NP
Surr: Dibromofluoromethane	105	82.2-120		%REC	223505	1	05/04/2016 18:45	NP
Surr: Toluene-d8	106	81.8-120		%REC	223505	1	05/04/2016 18:45	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-46
Project Name:	Rheem	**Collection Date:**	4/28/2016 10:55:00 AM
Lab ID:	1604P26-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
2-Butanone	BRL	50		ug/L	223505	1	05/04/2016 19:11	NP
2-Hexanone	BRL	10		ug/L	223505	1	05/04/2016 19:11	NP
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/04/2016 19:11	NP
Acetone	BRL	50		ug/L	223505	1	05/04/2016 19:11	NP
Benzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Bromoform	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Bromomethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Chloroethane	BRL	10		ug/L	223505	1	05/04/2016 19:11	NP
Chloroform	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Chloromethane	BRL	10		ug/L	223505	1	05/04/2016 19:11	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Cyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/04/2016 19:11	NP
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Freon-113	BRL	10		ug/L	223505	1	05/04/2016 19:11	NP
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Methyl acetate	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Methylene chloride	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
o-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-46
Project Name:	Rheem	**Collection Date:**	4/28/2016 10:55:00 AM
Lab ID:	1604P26-008	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Toluene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Trichloroethene	23	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:11	NP
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/04/2016 19:11	NP
Surr: 4-Bromofluorobenzene	88.7	70.7-125		%REC	223505	1	05/04/2016 19:11	NP
Surr: Dibromofluoromethane	103	82.2-120		%REC	223505	1	05/04/2016 19:11	NP
Surr: Toluene-d8	102	81.8-120		%REC	223505	1	05/04/2016 19:11	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-47
Project Name:	Rheem	**Collection Date:**	4/28/2016 2:37:00 PM
Lab ID:	1604P26-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
2-Butanone	BRL	50		ug/L	223505	1	05/04/2016 19:38	NP
2-Hexanone	BRL	10		ug/L	223505	1	05/04/2016 19:38	NP
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/04/2016 19:38	NP
Acetone	BRL	50		ug/L	223505	1	05/04/2016 19:38	NP
Benzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Bromoform	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Bromomethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Chloroethane	BRL	10		ug/L	223505	1	05/04/2016 19:38	NP
Chloroform	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Chloromethane	BRL	10		ug/L	223505	1	05/04/2016 19:38	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Cyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/04/2016 19:38	NP
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Freon-113	BRL	10		ug/L	223505	1	05/04/2016 19:38	NP
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Methyl acetate	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Methylene chloride	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
o-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-MW-47
Project Name:	Rheem	**Collection Date:**	4/28/2016 2:37:00 PM
Lab ID:	1604P26-009	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Toluene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Trichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/04/2016 19:38	NP
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/04/2016 19:38	NP
Surr: 4-Bromofluorobenzene	87.9	70.7-125		%REC	223505	1	05/04/2016 19:38	NP
Surr: Dibromofluoromethane	106	82.2-120		%REC	223505	1	05/04/2016 19:38	NP
Surr: Toluene-d8	107	81.8-120		%REC	223505	1	05/04/2016 19:38	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-54
Project Name:	Rheem	**Collection Date:**	4/26/2016 1:25:00 PM
Lab ID:	1604P26-010	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
2-Butanone	BRL	50		ug/L	223505	1	05/04/2016 20:04	NP
2-Hexanone	BRL	10		ug/L	223505	1	05/04/2016 20:04	NP
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/04/2016 20:04	NP
Acetone	BRL	50		ug/L	223505	1	05/04/2016 20:04	NP
Benzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Bromoform	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Bromomethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Chloroethane	BRL	10		ug/L	223505	1	05/04/2016 20:04	NP
Chloroform	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Chloromethane	BRL	10		ug/L	223505	1	05/04/2016 20:04	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Cyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/04/2016 20:04	NP
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Freon-113	BRL	10		ug/L	223505	1	05/04/2016 20:04	NP
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Methyl acetate	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Methylene chloride	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
o-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16117-MW-54
Project Name:	Rheem	**Collection Date:**	4/26/2016 1:25:00 PM
Lab ID:	1604P26-010	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Toluene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Trichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:04	NP
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/04/2016 20:04	NP
Surr: 4-Bromofluorobenzene	93.9	70.7-125		%REC	223505	1	05/04/2016 20:04	NP
Surr: Dibromofluoromethane	105	82.2-120		%REC	223505	1	05/04/2016 20:04	NP
Surr: Toluene-d8	104	81.8-120		%REC	223505	1	05/04/2016 20:04	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-DUP
Project Name:	Rheem	**Collection Date:**	4/28/2016 12:00:00 PM
Lab ID:	1604P26-011	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
1,1,1-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,1,2,2-Tetrachloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,1,2-Trichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,1-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,1-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,2,4-Trichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,2-Dibromo-3-chloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,2-Dibromoethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,2-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,2-Dichloroethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,2-Dichloropropane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,3-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
1,4-Dichlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
2-Butanone	BRL	50		ug/L	223505	1	05/04/2016 20:31	NP
2-Hexanone	BRL	10		ug/L	223505	1	05/04/2016 20:31	NP
4-Methyl-2-pentanone	BRL	10		ug/L	223505	1	05/04/2016 20:31	NP
Acetone	BRL	50		ug/L	223505	1	05/04/2016 20:31	NP
Benzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Bromodichloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Bromoform	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Bromomethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Carbon disulfide	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Carbon tetrachloride	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Chlorobenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Chloroethane	BRL	10		ug/L	223505	1	05/04/2016 20:31	NP
Chloroform	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Chloromethane	BRL	10		ug/L	223505	1	05/04/2016 20:31	NP
cis-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
cis-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Cyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Dibromochloromethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Dichlorodifluoromethane	BRL	10		ug/L	223505	1	05/04/2016 20:31	NP
Ethylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Freon-113	BRL	10		ug/L	223505	1	05/04/2016 20:31	NP
Isopropylbenzene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
m,p-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Methyl acetate	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Methyl tert-butyl ether	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Methylcyclohexane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Methylene chloride	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
o-Xylene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP

Qualifiers:

- * Value exceeds maximum contaminant level
- BRL Below reporting limit
- H Holding times for preparation or analysis exceeded
- N Analyte not NELAC certified
- B Analyte detected in the associated method blank
- > Greater than Result value
- E Estimated (value above quantitation range)
- S Spike Recovery outside limits due to matrix
- Narr See case narrative
- NC Not confirmed
- < Less than Result value
- J Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc **Date:** 5-May-16

Client:	Environmental Planning Specialists, Inc.	**Client Sample ID:**	16119-DUP
Project Name:	Rheem	**Collection Date:**	4/28/2016 12:00:00 PM
Lab ID:	1604P26-011	**Matrix:**	Groundwater

Analyses	Result	Reporting Limit	Qual	Units	BatchID	Dilution Factor	Date Analyzed	Analyst
TCL VOLATILE ORGANICS SW8260B				**(SW5030B)**				
Styrene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Tetrachloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Toluene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
trans-1,2-Dichloroethene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
trans-1,3-Dichloropropene	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Trichloroethene	60	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Trichlorofluoromethane	BRL	5.0		ug/L	223505	1	05/04/2016 20:31	NP
Vinyl chloride	BRL	2.0		ug/L	223505	1	05/04/2016 20:31	NP
Surr: 4-Bromofluorobenzene	90.4	70.7-125		%REC	223505	1	05/04/2016 20:31	NP
Surr: Dibromofluoromethane	105	82.2-120		%REC	223505	1	05/04/2016 20:31	NP
Surr: Toluene-d8	103	81.8-120		%REC	223505	1	05/04/2016 20:31	NP

Qualifiers:

*	Value exceeds maximum contaminant level	E	Estimated (value above quantitation range)
BRL	Below reporting limit	S	Spike Recovery outside limits due to matrix
H	Holding times for preparation or analysis exceeded	Narr	See case narrative
N	Analyte not NELAC certified	NC	Not confirmed
B	Analyte detected in the associated method blank	<	Less than Result value
>	Greater than Result value	J	Estimated value detected below Reporting Limit

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client EPS Work Order Number 1104926

Checklist completed by [signature] 4/29
Signature Date

Carrier name: FedEx __ UPS __ Courier __ Client ✓ US Mail __ Other _____

Shipping container/cooler in good condition?	Yes ✓	No __	Not Present __
Custody seals intact on shipping container/cooler?	Yes __	No __	Not Present ✓
Custody seals intact on sample bottles?	Yes __	No __	Not Present ✓
Container/Temp Blank temperature in compliance? (0°≤6°C)*	Yes ✓	No __	

Cooler #1 1.9 Cooler #2 _____ Cooler #3 _____ Cooler #4 _____ Cooler#5 _____ Cooler #6 _____

Chain of custody present?	Yes ✓	No __
Chain of custody signed when relinquished and received?	Yes ✓	No __
Chain of custody agrees with sample labels?	Yes ✓	No __
Samples in proper container/bottle?	Yes ✓	No __
Sample containers intact?	Yes ✓	No __
Sufficient sample volume for indicated test?	Yes ✓	No __
All samples received within holding time?	Yes ✓	No __
Was TAT marked on the COC?	Yes ✓	No __
Proceed with Standard TAT as per project history?	Yes __	No __ Not Applicable ✓
Water - VOA vials have zero headspace?	No VOA vials submitted __	Yes ✓ No __
Water - pH acceptable upon receipt?	Yes ✓	No __ Not Applicable __

Adjusted? _____ Checked by _____

Sample Condition: Good ✓ Other(Explain) _____

(For diffusive samples or AIHA lead) Is a known blank included? Yes __ No ✓

See Case Narrative for resolution of the Non-Conformance.

* Samples do not have to comply with the given range for certain parameters.

\\Aes_server\I\Sample Receipt\My Documents\COCs and pH Adjustment Sheet\Sample_Cooler_Recipt_Checklist_Rev1.rtf

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1604P26

ANALYTICAL QC SUMMARY REPORT

BatchID: 223505

Sample ID: **MB-223505** Client ID: Units: **ug/L** Prep Date: **05/03/2016** Run No: **315917**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **223505** Analysis Date: **05/03/2016** Seq No: **6803115**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	BRL	5.0									
1,1,2,2-Tetrachloroethane	BRL	5.0									
1,1,2-Trichloroethane	BRL	5.0									
1,1-Dichloroethane	BRL	5.0									
1,1-Dichloroethene	BRL	5.0									
1,2,4-Trichlorobenzene	BRL	5.0									
1,2-Dibromo-3-chloropropane	BRL	5.0									
1,2-Dibromoethane	BRL	5.0									
1,2-Dichlorobenzene	BRL	5.0									
1,2-Dichloroethane	BRL	5.0									
1,2-Dichloropropane	BRL	5.0									
1,3-Dichlorobenzene	BRL	5.0									
1,4-Dichlorobenzene	BRL	5.0									
2-Butanone	BRL	50									
2-Hexanone	BRL	10									
4-Methyl-2-pentanone	BRL	10									
Acetone	BRL	50									
Benzene	BRL	5.0									
Bromodichloromethane	BRL	5.0									
Bromoform	BRL	5.0									
Bromomethane	BRL	5.0									
Carbon disulfide	BRL	5.0									
Carbon tetrachloride	BRL	5.0									
Chlorobenzene	BRL	5.0									
Chloroethane	BRL	10									
Chloroform	BRL	5.0									
Chloromethane	BRL	10									

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1604P26

ANALYTICAL QC SUMMARY REPORT

BatchID: 223505

Sample ID: **MB-223505** Client ID: Units: **ug/L** Prep Date: **05/03/2016** Run No: **315917**
SampleType: **MBLK** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **223505** Analysis Date: **05/03/2016** Seq No: **6803115**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	BRL	5.0									
cis-1,3-Dichloropropene	BRL	5.0									
Cyclohexane	BRL	5.0									
Dibromochloromethane	BRL	5.0									
Dichlorodifluoromethane	BRL	10									
Ethylbenzene	BRL	5.0									
Freon-113	BRL	10									
Isopropylbenzene	BRL	5.0									
m,p-Xylene	BRL	5.0									
Methyl acetate	BRL	5.0									
Methyl tert-butyl ether	BRL	5.0									
Methylcyclohexane	BRL	5.0									
Methylene chloride	BRL	5.0									
o-Xylene	BRL	5.0									
Styrene	BRL	5.0									
Tetrachloroethene	BRL	5.0									
Toluene	BRL	5.0									
trans-1,2-Dichloroethene	BRL	5.0									
trans-1,3-Dichloropropene	BRL	5.0									
Trichloroethene	BRL	5.0									
Trichlorofluoromethane	BRL	5.0									
Vinyl chloride	BRL	2.0									
Surr: 4-Bromofluorobenzene	46.33	0	50.00		92.7	70.7	125				
Surr: Dibromofluoromethane	50.58	0	50.00		101	82.2	120				
Surr: Toluene-d8	48.23	0	50.00		96.5	81.8	120				

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1604P26

ANALYTICAL QC SUMMARY REPORT

BatchID: 223505

Sample ID: **LCS-223505** Client ID: Units: **ug/L** Prep Date: **05/03/2016** Run No: **315917**
SampleType: **LCS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **223505** Analysis Date: **05/03/2016** Seq No: **6803109**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	48.62	5.0	50.00		97.2	65.3	137				
Benzene	46.77	5.0	50.00		93.5	74.9	123				
Chlorobenzene	44.86	5.0	50.00		89.7	73.9	124				
Toluene	44.52	5.0	50.00		89.0	75	124				
Trichloroethene	45.39	5.0	50.00		90.8	73.1	128				
Surr: 4-Bromofluorobenzene	45.76	0	50.00		91.5	70.7	125				
Surr: Dibromofluoromethane	47.80	0	50.00		95.6	82.2	120				
Surr: Toluene-d8	47.22	0	50.00		94.4	81.8	120				

Sample ID: **1604P26-006AMS** Client ID: **16119-MW-44** Units: **ug/L** Prep Date: **05/03/2016** Run No: **315917**
SampleType: **MS** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **223505** Analysis Date: **05/03/2016** Seq No: **6803128**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	45.64	5.0	50.00		91.3	60	150				
Benzene	43.89	5.0	50.00		87.8	70.1	132				
Chlorobenzene	42.32	5.0	50.00		84.6	70.9	131				
Toluene	40.99	5.0	50.00		82.0	70.1	133				
Trichloroethene	42.63	5.0	50.00		85.3	70	136				
Surr: 4-Bromofluorobenzene	45.10	0	50.00		90.2	70.7	125				
Surr: Dibromofluoromethane	46.18	0	50.00		92.4	82.2	120				
Surr: Toluene-d8	47.13	0	50.00		94.3	81.8	120				

Sample ID: **1604P26-006AMSD** Client ID: **16119-MW-44** Units: **ug/L** Prep Date: **05/03/2016** Run No: **315917**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **223505** Analysis Date: **05/03/2016** Seq No: **6803130**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
1,1-Dichloroethene	44.79	5.0	50.00		89.6	60	150	45.64	1.88	17.7	
Benzene	44.13	5.0	50.00		88.3	70.1	132	43.89	0.545	20	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

Client: Environmental Planning Specialists, Inc.
Project Name: Rheem
Workorder: 1604P26

ANALYTICAL QC SUMMARY REPORT

BatchID: 223505

Sample ID: **1604P26-006AMSD** Client ID: **16119-MW-44** Units: **ug/L** Prep Date: **05/03/2016** Run No: **315917**
SampleType: **MSD** TestCode: **TCL VOLATILE ORGANICS SW8260B** BatchID: **223505** Analysis Date: **05/03/2016** Seq No: **6803130**

Analyte	Result	RPT Limit	SPK value	SPK Ref Val	%REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Chlorobenzene	41.51	5.0	50.00		83.0	70.9	131	42.32	1.93	20	
Toluene	42.98	5.0	50.00		86.0	70.1	133	40.99	4.74	20	
Trichloroethene	42.72	5.0	50.00		85.4	70	136	42.63	0.211	20	
Surr: 4-Bromofluorobenzene	45.03	0	50.00		90.1	70.7	125	45.10	0	0	
Surr: Dibromofluoromethane	49.72	0	50.00		99.4	82.2	120	46.18	0	0	
Surr: Toluene-d8	49.01	0	50.00		98.0	81.8	120	47.13	0	0	

Qualifiers:

>	Greater than Result value	<	Less than Result value	B	Analyte detected in the associated method blank
BRL	Below reporting limit	E	Estimated (value above quantitation range)	H	Holding times for preparation or analysis exceeded
J	Estimated value detected below Reporting Limit	N	Analyte not NELAC certified	R	RPD outside limits due to matrix
Rpt Lim	Reporting Limit	S	Spike Recovery outside limits due to matrix		

EPS

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 1-29-2014

Well ID: MW-54 (well development) **Field Conditions:** ~45 °F, clear

Sampling Performed By: Alex Testoff

Well Construction: flush mount **General Condition of Well:** good

Well Labeled: yes **Well Cap:** yes **Well Locked:** no **Condition of surrounding area:** grass

Well depth from TOC: 139.92 **Depth to Water from TOC:** 17.43

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 120.49'

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 19.28 gal **Three Well Volumes (gal):** 57.84

Purging Method: low flow, low stress (bladder pump) **Time @ Start of Purge:** 9:15

Sample Method: NA **Sample Parameters:** NA

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
11:00	15.0								* ball valve @ top of bladder pump clogged; unclogged valve & restarted pump @ ~ 11:30
13:44	46.5	21.56	10.02	-443	0.234	187	10.56	22.43	
14:18	55.0	21.43	9.75	-469	0.264	101	1.18	22.46	
14:28	57.5	21.79	9.73	-472	0.266	36.4	0.11	22.46	
14:38	60.0	21.89	9.77	-473	0.269	27.8	0.00	22.45	
14:48	63.0	21.77	9.76	-475	0.270	16.1	0.00	22.45	
14:58	65.0	21.63	9.78	-478	0.270	11.2	0.00	22.47	
15:03	66.0	21.71	9.78	-477	0.271	9.74	0.00	22.45	
15:08	67.0	21.70	9.79	-479	0.270	9.91	0.09		

Sample ID:_____ Time Collected:_____ Technician Signature Alex Testoff

EPS

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 2-26-2016

Well ID: MW-54 **Field Conditions:** ~65 °F, clear

Sampling Performed By: Alex Testoff

Well Construction: flush mount **General Condition of Well:** good

Well Labeled: yes **Well Cap:** yes **Well Locked:** no **Condition of surrounding area:** grass

Well depth from TOC: 139.92 **Depth to Water from TOC:** 20.07

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 119.85'

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 19.18 gal **Three Well Volumes (gal):** 57.5

Purging Method: low flow, low volume **Time @ Start of Purge:** 14:13

Sample Method: direct, downhole pump **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
14:34	3.0	18.80	8.89	-544	0.379	27.3	1.85	20.88	*pumping @ slowest possible rate from middle of screened interval
14:43	4.25	18.93	8.97	-506	0.371	19.3	1.76	20.87	
14:55	6.0	19.18	9.01	-499	0.378	13.5	1.25	20.91	
15:05	7.25	18.90	8.95	-489	0.384	4.97	1.18	20.90	
15:15	9.0	18.99	8.94	-483	0.382	3.33	1.17	20.92	
15:25	10.5	19.18	8.94	-485	0.381	6.68	1.12	20.93	

Sample ID: 16057-MW-54 Time Collected: 15:27 Technician Signature: Alex Testoff

APPENDIX E
Monitoring Well Development and Sampling Forms

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/27/16

Well ID: MW-33 **Field Conditions:**

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: **General Condition of Well:**

Well Labeled: **Well Cap:** **Well Locked:** **Condition of surrounding area:**

Well depth from TOC: 157 **Depth to Water from TOC:** 29.46

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 127.54

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 20.41 **Three Well Volumes (gal):** 61.23

Purging Method: low flow low volume **Time @ Start of Purge:** 13:10 - Restarted @ 13:55

Sample Method: direct - down hole pump **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1420	4	20.73	7.46	-192	0.363	59.8	2.65	45.89	replaced pump motor
1500	7	22.16	7.63	-195	0.360	24.6	3.16	52.03	
1525	10	21.35	7.49	-179	0.354	16.4	2.14	57.92	increase purge rate
1550/1600	17	20.68	7.49	-178	0.357	18.2	0.75	73.35	
1610	20	21.34	7.56	-169	0.356	16.9	0.87	85.52	
1635	23	21.14	7.57	-146	0.354	14.3	0.51	100.57	
1655	26	20.59	7.58	-116	0.352	12.2	0.17	123.65	
1710	30	20.42	7.48	-166	0.374	11.8	0.82	145.72	
1736	34								Well is dry
4/28									
1730	Restart purge							29.58	
1735	0.5	21.44	6.66	175	0.354	47.6	2.52		
1740	1.0	21.58	6.69	-52	0.360	20.7	2.02		

Sample ID: 16119-MW-33 Time Collected: 1742 Technician Signature: Alex Testoff

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/28/16

Well ID: MW-34 **Field Conditions:** ~70 °F, partly cloudy

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: ~~flush~~ stick-up flush mount **General Condition of Well:** good

Well Labeled: Y **Well Cap:** Y **Well Locked:** Y **Condition of surrounding area:** grass

Well depth from TOC: 182' **Depth to Water from TOC:** 0.55

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 181.45'

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 29.03 gal **Three Well Volumes (gal):** 87.10 gal

Purging Method: low flow, low stress **Time @ Start of Purge:** 0855

Sample Method: direct/downhole **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
0945	14.0	20.94	6.16	145	0.251	298	1.03	0.75	
1015	21.0	20.78	6.47	107	0.239	1.93	0.85	0.76	
1026	24.0	20.80	6.82	115	0.244	1.49	0.78	0.76	
1038	27.0	21.09	6.79	122	0.233	1.07	0.63	0.78	
1050	28.5	20.97	6.78	124	0.232	1.38	0.49	0.76	
1108	33.0	20.77	6.77	140	0.273	0.45	0.29	0.79	
1120	35.0	20.91	6.82	125	0.232	0.20	0.34	0.79	

Sample ID: 16119-MW-34 Time Collected: 1125

16119-DUP 1200

Technician Signature

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/26/16

Well ID: MW-35 **Field Conditions:** ~80 °F, cloudy

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: flush mount **General Condition of Well:** good

Well Labeled: No **Well Cap:** yes **Well Locked:** yes **Condition of surrounding area:** ~~flood~~ saturated

Well depth from TOC: 107' **Depth to Water from TOC:** 1.24

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 105.76'

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 16.92 gal **Three Well Volumes (gal):** 50.76

Purging Method: low flow, low volume **Time @ Start of Purge:** 1503

Sample Method: direct/downhole pump **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1535	3.5	22.87	6.73	-172	0.306	42.8	1.55	15.75	* purging @ slowest possible rate
1609	6.5	25.76	6.64	-159	0.305	11.8	0.34	18.20	
1640	10	24.58	6.67	-163	0.305	1.00	0.00	19.31	
~~1656~~ 1730	15.	22.68	6.62	-158	0.305	0.00	0.10	20.17	
~~1745~~ 1745	16.5	19.98	6.69	-162	0.304	1.62	0.01	20.25	
1750	17.0	20.06	6.67	-165	0.305	1.34	0.00	20.28	

1755

Sample ID: 16117-MW-35 Time Collected: ~~1740~~ 1755 Technician Signature: Alex Testoff

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/26/16

Well ID: MW-36 **Field Conditions:** 70 - Sunny

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: Flush **General Condition of Well:** ~~Tall grass~~ good

Well Labeled: NO **Well Cap:** Yes **Well Locked:** Yes **Condition of surrounding area:** Tallgrass

Well depth from TOC: 62' **Depth to Water from TOC:** 4.09

Well Diameter (in): 3 **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 57.91

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 9.27 **Three Well Volumes (gal):** 27.80

Purging Method: low flow low volume **Time @ Start of Purge:** 1015

Sample Method: direct / down hole pump **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1110	11	18.64	6.97	183	0.625	85.4	1.89	6.89	lowest possible purge rate
1128	17	18.46	6.34	95	0.627	16.4	0.11	7.03	
1140	21	18.45	6.36	93	0.627	14.4	0.00	7.05	
1158	27	18.60	6.39	98	0.626	8.12	0.00	6.96	

Sample ID: 16117-MW-36 Time Collected: 1150 Technician Signature: Alex Testoff

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/27/16

Well ID: MW-43 **Field Conditions:** Sunny · 80°

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: flush **General Condition of Well:** Good

Well Labeled: No **Well Cap:** Yes **Well Locked:** No **Condition of surrounding area:** Grass

Well depth from TOC: 112 **Depth to Water from TOC:** 25.65

Well Diameter (in): 2 **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 86.35

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 13.82 **Three Well Volumes (gal):** 41.45

Purging Method: low flow low volume **Time @ Start of Purge:** 1330

Sample Method: direct · downhole pump **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1400	6.0	21.37	6.09	-11	0.298	20.3	1.37	28.47	Slowest purge rate
1425	9.0	21.88	6.06	-22	0.291	22.7	0.20	29.03	
1445	12.0	20.50	6.04	-22	0.299	13.8	0.01	29.08	
1515	15.5	20.57	6.06	-22	0.290	10.12	0.00	29.17	
1530	18.25	20.60	6.06	-23	0.291	8.72	0.00	29.38	

Sample ID: 16118-MW-43 Time Collected: 1535 (BG) 1435 Technician Signature

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/28/15

Well ID: MW-44 **Field Conditions:** ~80°F, partly cloudy

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: flush mount **General Condition of Well:**

Well Labeled: no **Well Cap:** Y **Well Locked:** Y **Condition of surrounding area:**

Well depth from TOC: 90' **Depth to Water from TOC:** 6.74

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 83.26'

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 13.32 **Three Well Volumes (gal):** ~~39.96~~ 39.96

Purging Method: low flow, low stress **Time @ Start of Purge:** 1324

Sample Method: direct / downhole **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1400	6.0	18.69	6.28	153	0.220	41.5	2.70	10.65	*purging @ slowest
1421	10.0	18.79	6.29	146	0.223	20.2	2.35	11.24	possible rate
1450	15.0	18.89	6.28	150	0.223	15.1	3.57	11.14	
1500	17.5	18.90	6.28	151	0.223	6.15	2.49	11.16	

Sample ID: 16119-MW-44 Time Collected: 1502 Technician Signature: Alex Testoff

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/26/16

Well ID: MW-45 **Field Conditions:** 80- cloudy

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: flush **General Condition of Well:** good

Well Labeled: NO **Well Cap:** yes **Well Locked:** NO **Condition of surrounding area:** Grass

Well depth from TOC: 95' **Depth to Water from TOC:** 23.45

Well Diameter (in): 2 **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 71.55

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 11.45 **Three Well Volumes (gal):** 34.34

Purging Method: low flow /low Volume **Time @ Start of Purge:** 1405

Sample Method: direct - downhole pump **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1425	2	23.46	8.42	-248	0.230	11.9	2.86	33.90	lowest purge rate
1440	3.5	25.37	8.41	-237	0.225	8.94	1.19	35.94	
1450	5.0	25.02	8.43	-230	0.242	8.76	1.08	36.00	
~~1500~~									
~~DRY 1510~~									
1510	7.0	24.75	8.46	-255	0.249	8.13	0.40	36.13	
1530	9.0	22.77	8.48	-241	0.248	6.88	0.00	36.25	
1555	11.5	23.03	8.44	-252	0.246	6.71	0.00	36.54	

Sample ID: 16117- MW-45 Time Collected: 1600 Technician Signature

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/28/16

Well ID: MW-4C **Field Conditions:** ~70°F, partly cloudy
Sampling Performed By: Alex Testoff & Brian Goldman
Well Construction: ~~Aw~~ Stick-up Flush mount **General Condition of Well:** good
Well Labeled: N **Well Cap:** Y **Well Locked:** Y **Condition of surrounding area:** grass
Well depth from TOC: 52.82' **Depth to Water from TOC:** 2.49'
Well Diameter (in): 2" **Method of measure:** Water Level Meter
Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 50.33'
Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 8.05 gal **Three Well Volumes (gal):** 24.16
Purging Method: low flow, low stress **Time @ Start of Purge:** 0907
Sample Method: downhole/direct **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
0950	6.0	18.41	6.02	128	0.285	82.9	2.45	3.74	
1020	11.0	18.32	6.14	104	0.276	4.96	1.63	3.76	
1043	15.0	18.19	6.17	102	0.275	0.06	1.54	3.78	
1053	17.0	18.22	6.17	102	0.275	0.00	1.51	3.77	

Sample ID: 16119-MW-4C Time Collected: 1055 Technician Signature: Alex Testoff

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/28/16

Well ID: MW-47 **Field Conditions:** ~80°F, partly cloudy

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: ~~Flush-mount~~ ~~Stick-up~~ Stick-up **General Condition of Well:** good

Well Labeled: no **Well Cap:** Y **Well Locked:** Y **Condition of surrounding area:** grass

Well depth from TOC: 96.94' **Depth to Water from TOC:** 5.08

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 91.86'

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 14.70 **Three Well Volumes (gal):** 44.09

Purging Method: low flow, low stress **Time @ Start of Purge:** 1311

Sample Method: downhole/direct **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1342	7.5	18.28	7.15	-69	0.294	30.3	0.00	6.59	* purging ~~out~~
1406	10.5	18.27	7.22	-64	0.294	6.87	0.00	6.60	
1415	12.5	18.20	7.41	-73	0.294	2.83	0.00	6.62	
1427	14.5	18.24	7.45	-76	0.293	2.64	0.00	6.62	
1435	16.25	18.30	7.47	-80	0.293	9.08	0.00	6.64	

Sample ID: 16119-MW-47 Time Collected: 1437 Technician Signature: Alex Testoff

Monitoring Well Sampling Form

EPS Project: Rheem Manufacturing Company **Date:** 4/26/16

Well ID: MW-54 **Field Conditions:** 70 Sunny

Sampling Performed By: Alex Testoff & Brian Goldman

Well Construction: Flush **General Condition of Well:** Good

Well Labeled: No **Well Cap:** Yes **Well Locked:** No **Condition of surrounding area:** Ft. Tall grass

Well depth from TOC: 139.92 **Depth to Water from TOC:** 19.57

Well Diameter (in): 2" **Method of measure:** Water Level Meter

Height (Ht) of water in well (Well depth from TOC - Static level from TOC): 120.35

Volume of water in well (Ht. x(.16 for 2")(.653 for 4")(1.469 for 6"): 19.26 **Three Well Volumes (gal):** 57.77

Purging Method: low flow low volume **Time @ Start of Purge:** 10:35

Sample Method: direct / down hole pump **Sample Parameters:** VOCs

Time	Volume (gal)	Temp (°C)	pH	ORP (mV)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Depth to Water (ft)	Comments
1119	5	20.66	9.00	-485	0.304	28.2	7.05	25.04	purge at slowest possible rate
1145	8	20.51	9.05	-407	0.323	19.5	0.84	25.32	
1210	11	20.65	8.88	-391	0.329	9.44	0.00	25.85	
1242	15	21.32	8.84	-377	0.328	7.56	0.00	26.00	
1300	17	20.91	8.85	-362	0.321	7.85	0.00	26.05	
1320	20	21.28	8.82	-368	0.320	6.42	0.00	26.11	

Sample ID: 16117-MW-54 Time Collected: 1325 Technician Signature: Alex Testoff

APPENDIX F
Risk Reduction Standards Calculations

Table A. Georgia Specific Values

Parameter	CAS #	NC (mg/kg)	Table 2 Soil (mg/kg)	Table 1 GW (mg/L)	GA MCL (mg/L)
1,1,1-Trichloroethane	71-55-6	5.44		0.2	0.2
1,1,2,2-Tetrachloroethane	79-34-5	0.13		0.0002	
1,1,2-Trichloroethane	79-00-5	0.5		0.005	0.005
1,1-Dichloroethane	75-34-3	0.03		4	
1,1-Dichloroethene	75-35-4	0.36		0.007	0.007
1,2-Dichloroethane	107-06-2	0.02		0.005	0.005
1,2-Dichloropropane	78-87-5	0.02		0.005	0.005
2-Butanone (MEK)	78-93-3	0.79		2	
4-Methyl-2-pentanone	108-10-1	3.3		2	
Acetone	67-64-1	2.74		4	
Benzene	71-43-2	0.02		0.005	0.005
Bromoform	75-25-2	1		0.08	
Carbon disulfide	75-15-0			4	
Carbon tetrachloride	56-23-5	0.17		0.005	0.005
Chloroform	67-66-3	0.68		0.08	
Chloromethane	74-87-3	0.04		0.003	
cis-1,2-Dichloroethene	156-59-2	0.53		0.07	0.07
Dibromochloromethane	124-48-1	1.63		0.08	
Dichlorobromomethane	75-27-4	1.18		0.08	
Dichloromethane	75-09-2	0.08		0.005	0.005
Ethyl benzene	100-41-4	20		0.7	0.7
Freon-12	75-71-8	1.49		1	
Isopropylbenzene	98-82-8	21.88			
m-Xylene	108-38-3	20			
o-Xylene	95-47-6	20			
p-Xylene	106-42-3	20			
Tetrachloroethene	127-18-4	0.18		0.005	0.005
Toluene	108-88-3	14.4		1	1
trans-1,2-Dichloroethene	156-60-5	0.53		0.1	0.1
Trichloroethene	79-01-6	0.13		0.005	0.005
Vinyl chloride	75-01-4	0.04		0.002	0.002
Xylenes	1330-20-7	20			10

HSRA: Hazardous Site Response Act's Hazardous Site Response Rules ("Rules")
NC: Notification Concentration - Appendix I of the Rules
Table 2 Soil: Appendix III Table 2 of the Rules
Table 1 GW: Appendix III Table 1 of the Rules
GA MCL: Georgia Maximum Contaminant Level (Rules for Safe Drinking Water)

Table B. Physical-Chemical Parameters

Analyte	CAS	Organic Carbon Partition Coefficient (K_{oc}) (cm^3/g)		Diffusivity in air (D_a) (cm^2/s)		Henry's Law Constant (H') (unitless)	Henry's Law Constant at reference temperature of 25C (H) ($atm\text{-}m^3/mol$)		Volatile	Dei = Da x $E^{0.33}$	Kd* = Koc x OC	Kas =(H/Kd) x 41	α cm^2/s	VF m^3/kg
1,1,1-Trichloroethane	71-55-6	4.4E+01	EPI	6.5E-02	WATER9	7.0E-01	1.7E-02	PHYSPROP	V	0.045838887	0.8778	0.803372067	0.00643	1546
1,1,2,2-Tetrachloroethane	79-34-5	9.5E+01	EPI	4.9E-02	WATER9	1.5E-02	3.7E-04	PHYSPROP	V	0.034596664	1.8988	0.007924479	0.00006	19307
1,1,2-Trichloroethane	79-00-5	6.1E+01	EPI	6.7E-02	WATER9	3.4E-02	8.2E-04	PHYSPROP	V	0.047304913	1.214	0.027828666	0.00027	8793
1,1-Dichloroethane	75-34-3	3.2E+01	EPI	8.4E-02	WATER9	2.3E-01	5.6E-03	PHYSPROP	V	0.059153489	0.6364	0.362067882	0.00405	2110
1,1-Dichloroethene	75-35-4	3.2E+01	EPI	8.6E-02	WATER9	1.1E+00	2.6E-02	PHYSPROP	V	0.061038956	0.6364	1.681489629	0.01554	862
1,2-Dichloroethane	107-06-2	4.0E+01	EPI	8.6E-02	WATER9	4.8E-02	1.2E-03	PHYSPROP	V	0.060622697	0.792	0.061085859	0.00074	5225
1,2-Dichloropropane	78-87-5	6.1E+01	EPI	7.3E-02	WATER9	1.2E-01	2.8E-03	PHYSPROP	V	0.051866214	1.214	0.09523888	0.00098	4509
2-Butanone (MEK)	78-93-3	4.5E+00	EPI	9.1E-02	WATER9	2.3E-03	5.7E-05	PHYSPROP	V	0.064670783	0.0902	0.025863636	0.00034	7802
4-Methyl-2-pentanone	108-10-1	1.3E+01	EPI	7.0E-02	WATER9	5.6E-03	1.4E-04	EPI	V	0.049348227	0.252	0.022452381	0.00022	9590
Acetone	67-64-1	2.4E+00	EPI	1.1E-01	WATER9	1.4E-03	3.5E-05	PHYSPROP	V	0.07490772	0.04728	0.0303511	0.00046	6689
Benzene	71-43-2	1.5E+02	EPI	9.0E-02	WATER9	2.3E-01	5.6E-03	PHYSPROP	V	0.063318474	2.916	0.078034979	0.00099	4516
Bromoform	75-25-2	3.2E+01	EPI	3.6E-02	WATER9	2.2E-02	5.4E-04	PHYSPROP	V	0.025269965	0.6364	0.034467316	0.00018	10803
Carbon disulfide	75-15-0	2.2E+01	EPI	1.1E-01	WATER9	5.9E-01	1.4E-02	PHYSPROP	V	0.075272494	0.4346	1.358490566	0.01628	886
Carbon tetrachloride	56-23-5	4.4E+01	EPI	5.7E-02	WATER9	1.1E+00	2.8E-02	PHYSPROP	V	0.040411902	0.8778	1.289131921	0.00839	1248
Chloroform	67-66-3	3.2E+01	EPI	7.7E-02	WATER9	1.5E-01	3.7E-03	PHYSPROP	V	0.054397637	0.6364	0.236439346	0.00249	2756
Chloromethane	74-87-3	1.3E+01	EPI	1.2E-01	WATER9	3.6E-01	8.8E-03	PHYSPROP	V	0.08766816	0.2644	1.367700454	0.01907	817
cis-1,2-Dichloroethene	156-59-2	4.0E+01	EPI	8.8E-02	WATER9	1.7E-01	4.1E-03	PHYSPROP	V	0.062520469	0.792	0.211212121	0.00257	2726
Dibromochloromethane	124-48-1	3.2E+01	EPI	3.7E-02	WATER9	3.2E-02	7.8E-04	PHYSPROP	V	0.025908708	0.6364	0.050444689	0.00026	8805
Dichlorobromomethane	75-27-4	3.2E+01	EPI	5.6E-02	WATER9	8.7E-02	2.1E-03	PHYSPROP	V	0.039789141	0.6364	0.136580767	0.00107	4281
Dichloromethane	75-09-2	2.2E+01	EPI	1.0E-01	WATER9	1.3E-01	3.3E-03	PHYSPROP	V	0.070674914	0.4346	0.306603774	0.00414	2109
Ethyl benzene	100-41-4	4.5E+02	EPI	6.8E-02	WATER9	3.2E-01	7.9E-03	PHYSPROP	V	0.048418612	8.922	0.036211612	0.00035	7613
Freon-12	75-71-8	4.4E+01	EPI	7.6E-02	WATER9	1.4E+01	3.4E-01	PHYSPROP	V	0.053767946	0.8778	16.02073365	0.04113	167
Isopropylbenzene	98-82-8	7.0E+02	EPI	6.0E-02	WATER9	4.7E-01	1.2E-02	PHYSPROP	V	0.042647292	13.956	0.033784752	0.00029	8400
m-Xylene	108-38-3	3.8E+02	EPI	6.8E-02	WATER9	2.9E-01	7.2E-03	PHYSPROP	V	0.048348387	7.506	0.039219291	0.00038	7318
o-Xylene	95-47-6	3.8E+02	EPI	6.9E-02	WATER9	2.1E-01	5.2E-03	PHYSPROP	V	0.048740317	7.658	0.02773309	0.00027	8678
p-Xylene	106-42-3	3.8E+02	EPI	6.8E-02	WATER9	2.8E-01	6.9E-03	PHYSPROP	V	0.048265362	7.506	0.037689848	0.00037	7473
Tetrachloroethene	127-18-4	9.5E+01	EPI	5.0E-02	WATER9	7.2E-01	1.8E-02	PHYSPROP	V	0.035689855	1.8988	0.382188751	0.00257	2639
Toluene	108-88-3	2.3E+02	EPI	7.8E-02	WATER9	2.7E-01	6.6E-03	PHYSPROP	V	0.055022944	4.678	0.05819581	0.00064	5621
trans-1,2-Dichloroethene	156-60-5	4.0E+01	EPI	8.8E-02	WATER9	3.8E-01	9.4E-03	PHYSPROP	V	0.061957397	0.792	0.485580808	0.00556	1760
Trichloroethene	79-01-6	6.1E+01	EPI	6.9E-02	WATER9	4.0E-01	9.9E-03	PHYSPROP	V	0.048557648	1.214	0.332660626	0.00307	2436
Vinyl chloride	75-01-4	2.2E+01	EPI	1.1E-01	WATER9	1.1E+00	2.8E-02	PHYSPROP	V	0.075755441	0.4346	2.622641509	0.02634	580
Xylenes	1330-20-7	3.8E+02	EPI	6.9E-02	WATER9	2.7E-01	6.6E-03	PHYSPROP	V	0.048453689	7.658	0.035496213	0.00035	7687

EPI: EPA's Estimation Programs Interface Suite

WATER9: EPA's WATER9 Program

PHYSPROP: Syracuse Research Coorporation PHYSPROP Database. 2005

$VF\ (m^3/kg) = \frac{(LS \times V \times DH)}{A} \times \frac{(\pi \times \alpha \times T)^{1/2}}{(2 \times D_{ei} \times E \times K_{as} \times 10^{-3}\ kg/g)}$

LS =	45	m	length of side of contaminated area
V =	2.25	m/s	wind speed in mixing zone
DH =	2	m	diffusion height
A =	20300000	cm^2	area of contamination
π =	3.14		

$D_{ei} = D_i \times E^{0.33}$		cm^2/s	effective diffusivity
D_i =		Chemical specific	molecular diffusivity (cm^2/s)
E =	0.35		total soil porosity
ρ_s =	2.65	g/m^3	density of soil solids
Kas =	(H/Kd) x 41		soil/air partition coefficient (g soil/cm^3 air)
H =		Chemical specific	Henry's law constant ($atm\text{-}m^3/mol$)
Kd = Koc x OC			soil-water partition coefficient
Koc=		Chemical specific	organic carbon partition coefficient
OC =	0.02		soil organic carbon content fraction
T =	790000000 s		exposure interval

Table C. Toxicity Factors

Analyte	CAS	NonCancer Toxicity Values			Cancer Toxicity Values				
		Oral RfD	Inhalation RFC	Inhalation RfD	Oral CSF	Inhalation Unit Risk	Inhalation CSF	Cancer Class	VOC
		mg/kg-day	mg/m3	mg/kg-day	per mg/kg-day	per ug/m3	per mg/kg-day		
1,1,1-Trichloroethane	71-55-6	2	5	1.4				D	V
1,1,2,2-Tetrachloroethane	79-34-5	0.02			0.2	0.000058	0.203	C	V
1,1,2-Trichloroethane	79-00-5	0.004	0.0002	5.714E-05	0.057	0.000016	0.056	C	V
1,1-Dichloroethane	75-34-3	0.2			0.0057	0.0000016	0.0056	C	V
1,1-Dichloroethene	75-35-4	0.05	0.2	0.057				C	V
1,2-Dichloroethane	107-06-2	0.006	0.007	0.002	0.091	0.000026	0.091	B2	V
1,2-Dichloropropane	78-87-5	0.09	0.004	0.0011	0.036	0.00001	0.035		V
2-Butanone (MEK)	78-93-3	0.6	5	1.4					V
4-Methyl-2-pentanone	108-10-1		3	0.86					V
Acetone	67-64-1	0.9	31	8.9					V
Benzene	71-43-2	0.004	0.03	0.0086	0.055	0.0000078	0.0273	A	V
Bromoform	75-25-2	0.02			0.0079	0.0000011	0.00385	B2	V
Carbon disulfide	75-15-0	0.1	0.7	0.2					V
Carbon tetrachloride	56-23-5	0.004	0.1	0.029	0.07	0.000006	0.021	B2	V
Chloroform	67-66-3	0.01	0.098	0.028	0.031	0.000023	0.0805	B2	V
Chloromethane	74-87-3		0.09	0.026					V
cis-1,2-Dichloroethene	156-59-2	0.002							V
Dibromochloromethane	124-48-1	0.02			0.084			C	V
Dichlorobromomethane	75-27-4	0.02			0.062	0.000037	0.1295		V
Dichloromethane	75-09-2	0.006	0.6	0.17	0.002	1E-08	0.000035	B2	V
Ethyl benzene	100-41-4	0.1	1	0.29	0.011	0.0000025	0.00875		V
Freon-12	75-71-8	0.2	0.1	0.029					V
Isopropylbenzene	98-82-8	0.1	0.4	0.11					V
m-Xylene	108-38-3	0.2	0.1	0.029					V
o-Xylene	95-47-6	0.2	0.1	0.029					V
p-Xylene	106-42-3	0.2	0.1	0.029					V
Tetrachloroethene	127-18-4	0.006	0.04	0.011	0.0021	2.6E-07	0.00091	B	V
Toluene	108-88-3	0.08	5	1.4					V
trans-1,2-Dichloroethene	156-60-5	0.02							V
Trichloroethene	79-01-6	0.0005	0.002	0.00057	0.046	0.0000041	0.014	A	V
Vinyl chloride	75-01-4	0.003	0.1	0.029	0.72	0.0000044	0.015	A	V
Xylenes	1330-20-7	0.2	0.1	0.029					V

Values are from the EPA Regional Screening Level Summary Table (Nov 2015), except where noted

IRIS: Intigrated Risk Information System (www.epa.gov/IRIS/)

Table D. Groundwater Risk Calculations

Analyte	CAS	Volatile?	Oral CSF	Inhalation CSF	RAGS Eqn. 1								
					Adult			Child			Worker		
					Ingestion	Inhalation	Total	Ingestion	Inhalation	Total	Ingestion	Inhalation	Total
			per mg/kg-day	per mg/kg-day	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1,1,1-Trichloroethane	71-55-6	V											
1,1,2,2-Tetrachloroethane	79-34-5	V	0.2	0.20	0.0043	0.0011	0.00089	0.0091	0.0012	0.0011	0.014	0.0014	0.0013
1,1,2-Trichloroethane	79-00-5	V	0.057	0.056	0.015	0.0041	0.0032	0.032	0.0043	0.0038	0.050	0.0051	0.0046
1,1-Dichloroethane	75-34-3	V	0.0057	0.0056	0.15	0.041	0.032	0.32	0.043	0.038	0.50	0.051	0.046
1,1-Dichloroethene	75-35-4	V											
1,2-Dichloroethane	107-06-2	V	0.091	0.091	0.0094	0.0025	0.0020	0.020	0.0027	0.0024	0.031	0.0031	0.0029
1,2-Dichloropropane	78-87-5	V	0.036	0.035	0.024	0.0065	0.0051	0.051	0.0070	0.0061	0.079	0.0082	0.0074
2-Butanone (MEK)	78-93-3	V											
4-Methyl-2-pentanone	108-10-1	V											
Acetone	67-64-1	V											
Benzene	71-43-2	V	0.055	0.027	0.015	0.0083	0.0054	0.033	0.0089	0.0070	0.052	0.010	0.0087
Bromoform	75-25-2	V	0.0079	0.0039	0.11	0.059	0.038	0.23	0.063	0.050	0.36	0.074	0.062
Carbon disulfide	75-15-0	V											
Carbon tetrachloride	56-23-5	V	0.07	0.021	0.012	0.011	0.0057	0.026	0.012	0.0080	0.041	0.014	0.010
Chloroform	67-66-3	V	0.031	0.0805	0.027	0.0028	0.0026	0.059	0.0030	0.0029	0.092	0.0036	0.0034
Chloromethane	74-87-3	V											
cis-1,2-Dichloroethene	156-59-2	V											
Dibromochloromethane	124-48-1	V	0.084		0.010		0.010	0.022		0.022	0.034		0.034
Dichlorobromomethane	75-27-4	V	0.062	0.13	0.014	0.0018	0.0016	0.029	0.0019	0.0018	0.046	0.0022	0.0021
Dichloromethane	75-09-2	V	0.002	0.000035	0.43	6.5	0.40	0.91	7.0	0.81	1.4	8.2	1.2
Ethyl benzene	100-41-4	V	0.011	0.0088	0.077	0.026	0.019	0.17	0.028	0.024	0.26	0.033	0.029
Freon-12	75-71-8	V											
Isopropylbenzene	98-82-8	V											
m-Xylene	108-38-3	V											
o-Xylene	95-47-6	V											
p-Xylene	106-42-3	V											
Tetrachloroethene	127-18-4	V	0.0021	0.00091	0.41	0.25	0.15	0.87	0.27	0.20	1.4	0.31	0.26
Toluene	108-88-3	V											
trans-1,2-Dichloroethene	156-60-5	V											
Trichloroethene	79-01-6	V	0.046	0.014	0.019	0.016	0.0085	0.040	0.017	0.012	0.062	0.020	0.015
Vinyl chloride	75-01-4	V	0.72	0.015	0.0012	0.015	0.0011	0.0025347	0.016	0.0022	0.0040	0.0185818	0.0032741
Xylenes	1330-20-7	V											

Table D. Groundwater Risk Calculations

$$\text{Ingestion/Oral C (mg/kg)} = \frac{TR \times BW \times AT}{EF \times ED \times (SFo \times IRw)}$$

$$\text{Inhalation C (mg/kg)} = \frac{TR \times BW \times AT}{EF \times ED \times (SFi \times K \times IRa)}$$

Note: Inhalation pathway not calculated if not volatile

$$\text{RAGS Eqn 1} = \frac{TR \times BW \times AT}{EF \times ED \times [(SFo \times IRw) + (SFi \times K \times IRa)]}$$

Parameter		Adult		Child		Worker	
		Value	Source	Value	Source	Value	Source
Body Weight, Adult (kg)	BW	70	1	15	2	70	1
Exposure Frequency, Resident Adult (d/yr)	EF	350	1	350	1	250	1
Exposure Duration, Resident Adult (yr)	ED	30	1	6	2	25	1
Soil Ingestion, Resident Adult (mg/d)	IRs	114	1	200	2	50	1
Water ingestion, Resident Adult (L/d)	IRw	2	1	1	1	1	1
Inhalation Rate, Resident Adult (m^3/d)	IRa	15	1	15	2	20	1
Averaging Time, Cancer, Adult (d)	AT	25550	1	25550	1	25550	1
Target Risk	TR	1E-05	1	1E-05	1	1E-05	1
Water-to-air volatilization factor (L/m3)	K	0.5	1	0.5	1	0.5	1
Particulate Emission Factor (m3/kg)	PEF	4630000000	1	4630000000	1	4630000000	1

Notes:

Source 1 - GaEPD Reg 391-3-19 Appendix III, Table 3

Source 2 - HSRA Guidance http://www.georgiaepd.org/Documents/hsraguideCSRRRS.html

Table E. Groundwater Hazard Calculations

Analyte	CAS	Volatile?	Oral RfD	Inhalation RfD	RAGS Eqn. 2								
					Adult			Child			Worker		
					Ingestion	Inhalation	Total	Ingestion	Inhalation	Total	Ingestion	Inhalation	Total
			mg/kg-day	mg/kg-day	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1,1,1-Trichloroethane	71-55-6	V	2	1.4	73	14	12	31	3.0	2.7	204	15	14
1,1,2,2-Tetrachloroethane	79-34-5	V	0.02		0.73		0.73	0.31		0.31	2.0		2.0
1,1,2-Trichloroethane	79-00-5	V	0.004	0.0	0.146	0.00056	0.00055	0.063	0.00012	0.00012	0.41	0.00058	0.00058
1,1-Dichloroethane	75-34-3	V	0.2		7.3		7.3	3.1		3.1	20.44		20.44
1,1-Dichloroethene	75-35-4	V	0.05	0.057	1.8	0.56	0.43	0.78	0.12	0.10	5.1	0.58	0.52
1,2-Dichloroethane	107-06-2	V	0.006	0.002	0.219	0.019	0.018	0.094	0.0042	0.0040	0.6132	0.020	0.020
1,2-Dichloropropane	78-87-5	V	0.09	0.0011	3.3	0.011	0.011	1.4	0.0024	0.0024	9.2	0.012	0.012
2-Butanone (MEK)	78-93-3	V	0.6	1.4	21.9	14	8.5	9.4	3.0	2.3	61.32	14.6	12
4-Methyl-2-pentanone	108-10-1	V		0.86		8.3	8.3		1.8	1.8		8.8	8.8
Acetone	67-64-1	V	0.9	8.9	32.85	86	24	14	18	8.0	92	91	46
Benzene	71-43-2	V	0.004	0.0086	0.146	0.083	0.053	0.063	0.018	0.014	0.4088	0.088	0.072
Bromoform	75-25-2	V	0.02		0.73		0.73	0.31		0.31	2.0		2.0
Carbon disulfide	75-15-0	V	0.1	0.2	3.7	1.9	1.3	1.6	0.42	0.33	10.22	2.0	1.7
Carbon tetrachloride	56-23-5	V	0.004	0.029	0.146	0.28	0.0957377	0.063	0.060	0.031	0.4088	0.29	0.17
Chloroform	67-66-3	V	0.01	0.028	0.365	0.27	0.16	0.16	0.058	0.043	1.0	0.29	0.22
Chloromethane	74-87-3	V		0.026		0.25	0.25		0.054	0.054		0.26	0.26
cis-1,2-Dichloroethene	156-59-2	V	0.002		0.073		0.073	0.031		0.031	0.2044		0.20
Dibromochloromethane	124-48-1	V	0.02		0.73		0.73	0.31		0.31	2.0		2.0
Dichlorobromomethane	75-27-4	V	0.02		0.73		0.73	0.31		0.31	2.0		2.0
Dichloromethane	75-09-2	V	0.006	0.17	0.219	1.7	0.19	0.094	0.36	0.074	0.6132	1.8	0.45
Ethyl benzene	100-41-4	V	0.1	0.29	3.7	2.8	1.6	1.6	0.60	0.43	10.22	2.9	2.3
Freon-12	75-71-8	V	0.2	0.029	7.3	0.28	0.27	3.1	0.060	0.058	20.44	0.29	0.29
Isopropylbenzene	98-82-8	V	0.1	0.11	3.7	1.1	0.85	1.6	0.24	0.21	10.22	1.2	1.0
m-Xylene	108-38-3	V	0.2	0.029	7.3	0.28	0.27	3.1	0.060	0.058	20.44	0.29	0.29
o-Xylene	95-47-6	V	0.2	0.029	7.3	0.28	0.27	3.1	0.060	0.058	20.44	0.29	0.29
p-Xylene	106-42-3	V	0.2	0.029	7.3	0.28	0.27	3.1	0.060	0.058	20.44	0.29	0.29
Tetrachloroethene	127-18-4	V	0.006	0.011	0.219	0.11	0.074	0.094	0.024	0.019	0.6132	0.12	0.098
Toluene	108-88-3	V	0.08	1.4	2.92	14	2.4	1.3	3.0	0.88	8.2	15	5.2
trans-1,2-Dichloroethene	156-60-5	V	0.02		0.73		0.73	0.31		0.31	2.044		2.0
Trichloroethene	79-01-6	V	0.0005	0.00057	0.018	0.0056	0.0043	0.0078	0.0012	0.0010	0.051	0.0058	0.0052
Vinyl chloride	75-01-4	V	0.003	0.029	0.1095	0.28	0.079	0.047	0.060	0.026	0.31	0.29	0.15
Xylenes	1330-20-7	V	0.2	0.029	7.3	0.28	0.27	3.128571	0.060	0.058	20.44	0.29	0.29

Table E. Groundwater Hazard Calculations

$$\text{Ingestion/Oral C (mg/kg)} = \frac{\text{THI x BW x AT}}{\text{EF x ED x (1/RfDo x IRw)}}$$

$$\text{Inhalation C (mg/kg)} = \frac{\text{THI x BW x AT}}{\text{EF x ED x (1/RfDi x K x IRa)}}$$

Note: Inhalation pathway not calculated if not volatile

$$\text{RAGS Eqn 2} = \frac{\text{THI x BW x AT}}{\text{EF x ED x [(1/RfDo x IRw) + (1/RfDi x K x IRa)]}}$$

Parameter		Adult		Child		Worker		
		Value	Source	Value	Source	Value	Source	
Body Weight, Adult (kg)	BW	70	1	15	2	70	1	
Exposure Frequency, Resident Adult (d/yr)	EF	350	1	350	1	250	1	
Exposure Duration, Resident Adult (yr)	ED	30	1	6	2	25	1	
Soil Ingestion, Resident Adult (mg/d)	IRs	114	1	200	2	50	1	
Water ingestion, Resident Adult (L/d)	IRw	2	1	1	1	1	1	
Inhalation Rate, Resident Adult (m^3/d)	IRa	15	1	15	2	20	1	
Averaging Time, Noncancer, Adult (d)	AT	10950	1	2190	1	9125	1	Exposure Duration x 365 days
Target hazard quotient	THQ	1	1	1	1	1	1	
Water-to-air volatilization factor (L/m3)	K	0.5	1	0.5	1	0.5	1	
Particulate Emission Factor (m3/kg)	PEF	4630000000	1	4630000000	1	4630000000	1	

Notes:

Source 1 - GaEPD Reg 391-3-19 Appendix III, Table 3

Source 2 - HSRA Guidance http://www.georgiaepd.org/Documents/hsraguideCSRRRS.html

Table F. Soil Risk Calculations

Analyte	CAS	Volatile?	VF	Oral CSF	Inhalation CSF	RAGS Eqn. 6								
						Adult			Child			Worker		
						Ingestion	Inhalation	Total	Ingestion	Inhalation	Total	Ingestion	Inhalation	Total
				per mg/kg-day	per mg/kg-day	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1,1,1-Trichloroethane	71-55-6	V	1546											
1,1,2-Trichloroethane	79-00-5	V	8793	0.057	0.056	262	18	17	160	19	17	1004	22	22
1,1-Dichloroethene	75-35-4	V	862											
2-Butanone (MEK)	78-93-3	V	7802											
Acetone	67-64-1	V	6689											
Carbon tetrachloride	56-23-5	V	1248	0.07	0.021	213	6.7	6.5	130	7.2	6.8	818	8.5	8.4
Chloroform	67-66-3	V	2756	0.031	0.081	482	3.9	3.9	294	4.2	4.1	1846	4.9	4.9
cis-1,2-Dichloroethene	156-59-2	V	2726											
Dichlorobromomethane	75-27-4	V	4281	0.062	0.13	241	3.8	3.7	147	4.0	3.9	923	4.7	4.7
Dichloromethane	75-09-2	V	2109	0.002	0.000035	7471	6842	3571	4563	7330	2812	28616	8620	6625
Ethyl benzene	100-41-4	V	7613	0.011	0.00875	1358	99	92	830	106	94	5203	124	122
Freon-12	75-71-8	V	167											
m-Xylene	108-38-3	V	7318											
o-Xylene	95-47-6	V	8678											
p-Xylene	106-42-3	V	7473											
Tetrachloroethene	127-18-4	V	2639	0.0021	0.00091	7115	329	315	4345	353	326	27253	415	409
Toluene	108-88-3	V	5621											
trans-1,2-Dichloroethene	156-60-5	V	1760											
Trichloroethene	79-01-6	V	2436	0.046	0.01435	325	19	18	198	21	19	1244	24	24

Table F. Soil Risk Calculations

Ingestion/Oral C (mg/kg) = $\frac{TR \times BW \times AT}{EF \times ED \times (SFo \times 10^{-6} \times IRs)}$

Inhalation C (mg/kg) = $\frac{TR \times BW \times AT}{EF \times ED \times (SFi \times IRa \times (1/VF + 1/PEF))}$

Note: VF not used if constituent is not volatile

RAGS Eqn 7 = $\frac{TR \times BW \times AT}{EF \times ED \times [(SFo \times 10^{-6} \times IRs) + (SFi \times IRa \times (1/VF + 1/PEF))]}$

Parameter		Adult		Child		Worker	
		Value	Source	Value	Source	Value	Source
Body Weight, Adult (kg)	BW	70	1	15	2	70	1
Exposure Frequency, Resident Adult (d/yr)	EF	350	1	350	1	250	1
Exposure Duration, Resident Adult (yr)	ED	30	1	6	2	25	1
Soil Ingestion, Resident Adult (mg/d)	IRs	114	1	200	2	50	1
Water ingestion, Resident Adult (L/d)	IRw	2	1	1	1	1	1
Inhalation Rate, Resident Adult (m^3/d)	IRa	15	1	15	2	20	1
Averaging Time, Cancer, Adult (d)	AT	25550	1	25550	1	25550	1
Target Risk	TR	1.00E-05	1	1.00E-05	1	1.00E-05	1
Water-to-air volatilization factor (L/m3)	K	0.5	1	0.5	1	0.5	1
Particulate Emission Factor (m3/kg)	PEF	4630000000	1	4630000000	1	4630000000	1

Notes:

Source 1 - GaEPD Reg 391-3-19 Appendix III, Table 3

Source 2 - HSRA Guidance http://www.georgiaepd.org/Documents/hsraguideCSRRRS.html

Table G. Soil Hazard Calculations

Analyte	CAS	Volatile?	VF	Oral RfD	Inhalation RfD	RAGS Eqn. 7								
						Adult			Child			Worker		
						Ingestion	Inhalation	Total	Ingestion	Inhalation	Total	Ingestion	Inhalation	Total
				mg/kg-day	mg/kg-day	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1,1,1-Trichloroethane	71-55-6	V	1546	2	1.4	1280702	10747	10658	156429	2303	2270	4088000	11284	11253
1,1,2-Trichloroethane	79-00-5	V	8793	0.004	5.714E-05	2561	2.4	2.4	313	0.5	0.5	8176	2.6	2.6
1,1-Dichloroethene	75-35-4	V	862	0.05	0.057	32018	240	238	3911	51	51	102200	252	251
2-Butanone (MEK)	78-93-3	V	7802	0.6	1.4	384211	54245	47534	46929	11624	9316	1226400	56957	54429
Acetone	67-64-1	V	6689	0.9	8.9	576316	288339	192186	70393	61787	32905	1839600	302756	259970
Carbon tetrachloride	56-23-5	V	1248	0.004	0.029	2561	174	162	313	37	33	8176	182	178
Chloroform	67-66-3	V	2756	0.01	0.028	6404	376	355	782	80	73	20440	394	387
cis-1,2-Dichloroethene	156-59-2	V	2726	0.002		1281		1281	156		156	4088		4088
Dichlorobromomethane	75-27-4	V	4281	0.02		12807		12807	1564		1564	40880		40880
Dichloromethane	75-09-2	V	2109	0.006	0.17	3842	1759	1207	469	377	209	12264	1847	1605
Ethyl benzene	100-41-4	V	7613	0.1	0.29	64035	10585	9084	7821	2268	1758	204400	11115	10541
Freon-12	75-71-8	V	167	0.2	0.029	128070	23	23	15643	5.0	5.0	408800	24	24
m-Xylene	108-38-3	V	7318	0.2	0.029	128070	1018	1010	15643	218	215	408800	1068	1066
o-Xylene	95-47-6	V	8678	0.2	0.029	128070	1207	1195	15643	259	254	408800	1267	1263
p-Xylene	106-42-3	V	7473	0.2	0.029	128070	1039	1031	15643	223	220	408800	1091	1088
Tetrachloroethene	127-18-4	V	2639	0.006	0.011	3842	147	141	469	31	29	12264	154	152
Toluene	108-88-3	V	5621	0.08	1.4	51228	39077	22168	6257	8374	3581	163520	41031	32801
trans-1,2-Dichloroethene	156-60-5	V	1760	0.02		12807		12807	1564		1564	40880		40880
Trichloroethene	79-01-6	V	2436	0.0005	0.00057	320	6.8	6.6	39	1.5	1.4	1022	7.1	7.1

Table G. Soil Hazard Calculations

Ingestion/Oral C (mg/kg) = $\frac{THI \times BW \times AT}{EF \times ED \times (1/RfDo \times 10^{-6} \times IRs)}$

Inhalation C (mg/kg) = $\frac{THI \times BW \times AT}{EF \times ED \times (1/RfDi \times IRa \times (1/VF + 1/PEF))}$

Note: VF not used if constituent is not volatile

RAGS Eqn 7 = $\frac{THI \times BW \times AT}{EF \times ED \times [(1/RfDo \times 10^{-6} \times IRs) + (1/RfDi \times IRa \times (1/VF + 1/PEF))]}$

Parameter		Adult		Child		Worker		
		Value	Source	Value	Source	Value	Source	
Body Weight, Adult (kg)	BW	70	1	15	2	70	1	
Exposure Frequency, Resident Adult (d/yr)	EF	350	1	350	1	250	1	
Exposure Duration, Resident Adult (yr)	ED	30	1	6	2	25	1	
Soil Ingestion, Resident Adult (mg/d)	IRs	114	1	200	2	50	1	
Water ingestion, Resident Adult (L/d)	IRw	2	1	1	1	1	1	
Inhalation Rate, Resident Adult (m^3/d)	IRa	15	1	15	2	20	1	
Averaging Time, Noncancer, Adult (d)	AT	10950	1	2190	1	9125	1	Exposure Duration x 365 days
Target hazard quotient	THQ	1.00E+00	1	1.00E+00	1	1.00E+00	1	
Water-to-air volatilization factor (L/m3)	K	0.5	1	0.5	1	0.5	1	
Particulate Emission Factor (m3/kg)	PEF	4630000000	1	4630000000	1	4630000000	1	

Notes:

Source 1 - GaEPD Reg 391-3-19 Appendix III, Table 3

Source 2 - HSRA Guidance http://www.georgiaepd.org/Documents/hsraguideCSRRRS.html

Table H. Groundwater Residential Risk Reduction Standards

Analyte	CAS	TYPE 1 GW RRS				TYPE 2 GW RRS								Residential GW RRS - higher of Type 1 and 2 mg/L
		Rule 391-3-19-.07(6)(b) and Guidance: The lesser of Table 1 App III and GA MCL (or where NA, the higher of DL or Bkg)				Rule 391-3-19-.07(7)(b): The lesser of Items 1 and 2 (or where NA, the higher of Table 1 App III, background or DL)								
						Item 1: RAGS Eqn 2 (NC)		Item 2: RAGS Eqn 1 (C)			Alternate, if NA			
		Table 1, App III mg/L	GA MCL mg/L	Bkg* mg/L	Type 1 GW RRS mg/L	Adult mg/L	Child mg/L	Adult mg/L	Child mg/L	Lesser of Items 1 and 2	Table 1, App III mg/L	Bkg* mg/L	Type 2 GW RRS mg/L	
1,1,1-Trichloroethane	71-55-6	0.2	0.2		0.2	12	2.7			2.7	0.2		2.7	2.7
1,1,2,2-Tetrachloroethane	79-34-5	0.0002			0.0002	0.73	0.31	0.00089	0.00106	0.00089	0.0002		0.00089	0.00089
1,1,2-Trichloroethane	79-00-5	0.005	0.005		0.005	0.00055	0.00012	0.0032	0.0038	0.0001	0.005		0.0001	0.0050
1,1-Dichloroethane	75-34-3	4			4	7.3	3.1	0.032	0.038	0.032	4		0.032	4.0
1,1-Dichloroethene	75-35-4	0.007	0.007		0.007	0.43	0.10			0.10	0.007		0.10	0.10
1,2-Dichloroethane	107-06-2	0.005	0.005		0.005	0.018	0.003994	0.0020	0.0024	0.0020	0.005		0.0020	0.005
1,2-Dichloropropane	78-87-5	0.005	0.005		0.005	0.011	0.00238	0.0051	0.0061	0.0024	0.005		0.0024	0.005
2-Butanone (MEK)	78-93-3	2			2	8.5	2.3			2.3	2		2.3	2.3
4-Methyl-2-pentanone	108-10-1	2			2	8.3	1.8			1.8	2		1.8	2.0
Acetone	67-64-1	4			4	24	8.0			8.0	4		8.0	8.0
Benzene	71-43-2	0.005	0.005		0.005	0.053	0.014	0.0054	0.0070	0.0054	0.005		0.0054	0.0054
Bromoform	75-25-2	0.08			0.08	0.73	0.31	0.038	0.050	0.038	0.08		0.038	0.08
Carbon disulfide	75-15-0	4			4	1.3	0.33			0.33	4		0.33	4.0
Carbon tetrachloride	56-23-5	0.005	0.005		0.005	0.096	0.031	0.0057	0.0080	0.0057	0.005		0.0057	0.0057
Chloroform	67-66-3	0.08			0.08	0.16	0.043	0.0026	0.0029	0.0026	0.08		0.0026	0.08
Chloromethane	74-87-3	0.003			0.003	0.25	0.054			0.054	0.003		0.054	0.054
cis-1,2-Dichloroethene	156-59-2	0.07	0.07		0.07	0.073	0.031			0.031	0.07		0.031	0.07
Dibromochloromethane	124-48-1	0.08			0.08	0.73	0.31	0.010	0.022	0.010	0.08		0.010	0.08
Dichlorobromomethane	75-27-4	0.08			0.08	0.73	0.31	0.0016	0.0018	0.0016	0.08		0.0016	0.08
Dichloromethane	75-09-2	0.005	0.005		0.005	0.19	0.074	0.40	0.81	0.074	0.005		0.074	0.074
Ethyl benzene	100-41-4	0.7	0.7		0.7	1.6	0.43	0.019	0.024	0.019	0.7		0.019	0.7
Freon-12	75-71-8	1			1	0.27	0.058			0.058	1		0.058	1
Isopropylbenzene	98-82-8				Bkg/DL	0.85	0.21			0.21			0.21	0.21
m-Xylene	108-38-3				Bkg/DL	0.27	0.058			0.058			0.058	0.058
o-Xylene	95-47-6				Bkg/DL	0.27	0.058			0.058			0.058	0.058
p-Xylene	106-42-3				Bkg/DL	0.27	0.058			0.058			0.058	0.058
Tetrachloroethene	127-18-4	0.005	0.005		0.005	0.074	0.019	0.15	0.20	0.019	0.005		0.019	0.019
Toluene	108-88-3	1	1		1	2.4	0.88			0.88	1		0.88	1
trans-1,2-Dichloroethene	156-60-5	0.1	0.1		0.1	0.73	0.31			0.31	0.1		0.31	0.31
Trichloroethene	79-01-6	0.005	0.005		0.005	0.0043	0.0010	0.0085	0.012	0.0010	0.005		0.0010	0.005
Vinyl chloride	75-01-4	0.002	0.002		0.002	0.079	0.026	0.0011	0.0022	0.0011	0.002		0.0011	0.002
Xylenes	1330-20-7		10		10	0.27	0.058			0.058			0.058	10

Table I. Groundwater Industrial Risk Reduction Standards

Analyte	CAS	TYPE 3 GW RRS	TYPE 4 GW RRS						Non-Residential RRS - higher of Type 3 and 4
		Rule 391-3-19-.07(8)(c) Same as Type 1 GW RRS	Rule 391-3-19-.07(9)(c): The lesser of Items 1 and 2 (or where NA, the higher of Table 1 App III, background and DL)						
			Item 1 RAGS Eqn 2 (NC)	Item 2 RAGS Eqn 1 (C)	Lesser of Items 1 and 2	Alternate		Type 4 GW RRS	
						Table 1 App III	Bkg*		
		mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L
1,1,1-Trichloroethane	71-55-6	0.2	14		14	0.2		14	14
1,1,2,2-Tetrachloroethane	79-34-5	0.0002	2.0	0.0013	0.0013	0.0002		0.0013	0.0013
1,1,2-Trichloroethane	79-00-5	0.005	0.00058	0.0046	0.00058	0.005		0.00058	0.005
1,1-Dichloroethane	75-34-3	4	20	0.046	0.046	4.0		0.046	4.0
1,1-Dichloroethene	75-35-4	0.007	0.52		0.52	0.007		0.52	0.52
1,2-Dichloroethane	107-06-2	0.005	0.020	0.0029	0.0029	0.005		0.0029	0.005
1,2-Dichloropropane	78-87-5	0.005	0.012	0.0074	0.0074	0.005		0.0074	0.0074
2-Butanone (MEK)	78-93-3	2	12		12	2.0		12	12
4-Methyl-2-pentanone	108-10-1	2	8.8		8.8	2.0		8.8	8.8
Acetone	67-64-1	4	46		46	4.0		46	46
Benzene	71-43-2	0.005	0.072	0.0087	0.0087	0.005		0.0087	0.0087
Bromoform	75-25-2	0.08	2.0	0.062	0.062	0.08		0.062	0.08
Carbon disulfide	75-15-0	4	1.7		1.7	4.0		1.7	4.0
Carbon tetrachloride	56-23-5	0.005	0.17	0.010	0.010	0.005		0.010	0.010
Chloroform	67-66-3	0.08	0.22	0.0034	0.0034	0.08		0.0034	0.08
Chloromethane	74-87-3	0.003	0.26		0.26	0.003		0.26	0.26
cis-1,2-Dichloroethene	156-59-2	0.07	0.20		0.20	0.07		0.20	0.20
Dibromochloromethane	124-48-1	0.08	2.0	0.034	0.034	0.08		0.034	0.08
Dichlorobromomethane	75-27-4	0.08	2.0	0.0021	0.0021	0.08		0.0021	0.08
Dichloromethane	75-09-2	0.005	0.45	1.2	0.45	0.005		0.45	0.45
Ethyl benzene	100-41-4	0.7	2.3	0.029	0.029	0.7		0.029	0.7
Freon-12	75-71-8	1	0.29		0.29	1.0		0.29	1.0
Isopropylbenzene	98-82-8	Bkg/DL	1.0		1.0			1.0	1.0
m-Xylene	108-38-3	Bkg/DL	0.29		0.29			0.29	0.29
o-Xylene	95-47-6	Bkg/DL	0.29		0.29			0.29	0.29
p-Xylene	106-42-3	Bkg/DL	0.29		0.29			0.29	0.29
Tetrachloroethene	127-18-4	0.005	0.098	0.26	0.098	0.005		0.098	0.098
Toluene	108-88-3	1	5.2		5.2	1.0		5.2	5.2
trans-1,2-Dichloroethene	156-60-5	0.1	2.0		2.0	0.1		2.0	2.0
Trichloroethene	79-01-6	0.005	0.005	0.015	0.005	0.005		0.005	0.005
Vinyl chloride	75-01-4	0.002	0.15	0.003	0.003	0.002		0.003	0.003
Xylenes	1330-20-7	10	0.29		0.29			0.29	10

Table J. Protection of Groundwater Soil Screening Level Calculations

Analyte	CAS	Physical/Chemical Properties			Type 1/2 SSL			Type 4 SSL		
		Unitless Henry's Law (H')[a]	Organic Carbon Partitioning Coefficient (Koc)	Soil-Water Partition Coefficient (Kd = Koc * OC)	Residential GW RRS (Higher of Type 1 and 2)	Target Soil Leachate Concentration (Cw = GW RRS * DAF)	Type 1/2 SSL[b]	Nonresidential GW RRS (Higher of Type 3 and 4)	Target Soil Leachate Concentration (Cw = GW RRS * DAF)	Type 4 SSL[b]
			(L/kg)	(L/kg)	(mg/L)	(mg/L)	(mg/kg)	(mg/L)	(mg/L)	(mg/kg)
1,1,1-Trichloroethane	71-55-6	0.70	44	0.088	2.7	54	19	14	273	96
1,1,2-Trichloroethane	79-00-5	0.034	61	0.12	0.005	0.1	0.032	0.005	0.1	0.032
1,1-Dichloroethene	75-35-4	1.1	32	0.064	0.10	2.1	0.74	0.52	10	3.8
2-Butanone (MEK)	78-93-3	0.0023	4.5	0.0090	2.3	45	9.5	12	236	49
Acetone	67-64-1	0.0014	2	0.0047	8.0	160	33	46	912	187
Carbon tetrachloride	56-23-5	1.1	44	0.088	0.0057	0.11	0.04	0.010	0.2044	0.079
Chloroform	67-66-3	0.15	32	0.064	0.08	1.6	0.44	0.08	1.6	0.44
cis-1,2-Dichloroethene	156-59-2	0.17	40	0.079	0.07	1.4	0.41	0.20	4.1	1.2
Dichlorobromomethane	75-27-4	0.087	32	0.064	0.08	1.6	0.43	0.08	1.6	0.43
Dichloromethane	75-09-2	0.13	22	0.043	0.074	1.5	0.38	0.45	9.1	2.3
Ethyl benzene	100-41-4	0.32	446	0.89	0.7	14	16	0.7	14	16
Freon-12	75-71-8	14	44	0.088	1.0	20	31	1	20	31
m-Xylene	108-38-3	0.29	375	0.75	0.058	1.2	1.1	0.29	5.8	5.6
o-Xylene	95-47-6	0.21	383	0.77	0.058	1.2	1.2	0.29	5.8	5.7
p-Xylene	106-42-3	0.28	375	0.75	0.058	1.2	1.1	0.29	5.8	5.6
Tetrachloroethene	127-18-4	0.72	95	0.19	0.019	0.38	0.17	0.098	2.0	0.89
Toluene	108-88-3	0.27	234	0.47	1.0	20	14	5.2	105	73
trans-1,2-Dichloroethene	156-60-5	0.38	40	0.079	0.31	6.3	2.0	2.044	41	13
Trichloroethene	79-01-6	0.40	61	0.12	0.005	0.1	0.036	0.0052	0.10	0.037

Notes:

DAF	**20.00**
OC (site specific organic carbon)=	**0.2%**
n (porosity)[c] =	**0.43**
ps (soil particle den. kg/L)[c] =	**2.65**
0w (water-filled soil por)[c] =	**0.3**
0a (air-filled soil por)[c] = n - 0w	**0.13**
pb (dry soil bulk den. kg/L)[c] =	**1.5**

[a] H is set to zero for metals, with the exception of mercury

[b] equation 4-10, Supplemental SSG (USEPA 2002) (p. 4-28), **SSL = Cw*(Kd+((0w+0a*H')/pb))**

[c] Default Soil Screening Guidance Values

NA = No Appendix III Groundwater Concentration available; SSL cannot be calculated.

Table K. Soil Residential Risk Reduction Standards

Analyte	CAS	TYPE 1 - SOIL											
		Rule 391-3-19-.07(6)(c): Table 2 Appendix III, or if not listed, the the least of Items 1-3 (and if not calculable the higher of background and DL)											
		Table 2 - Appendix III	Item 1 of Rule 391-3-19-.07(6)(c): Higher of (i), (ii), (iii)				Item 2 RAGS Eqn. 7 (NC)	Item 3 RAGS Eqn. 6 (C)			Least of Items 1 - 3	Bkg**	Type 1 Soil RRS
			(i): Appendix I (NC) - exclude []	(ii): Table 1 GW x 100 factor	(iii): TCLP*	Higher of i - iii	Adult	Adult	Carcin. Class	Adjusted Adult			
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg
1,1,1-Trichloroethane	71-55-6		5.44	20		20	10658		D		20		20
1,1,2-Trichloroethane	79-00-5		0.5	0.5		0.5	2	17	C	167	0.5		0.5
1,1-Dichloroethene	75-35-4		0.36	0.7		0.7	238		C		0.7		0.7
2-Butanone (MEK)	78-93-3		0.79	200		200	47534				200		200
Acetone	67-64-1		2.74	400		400	192186				400		400
Carbon tetrachloride	56-23-5		0.17	0.5		0.5	162	6.5	B2	6.5	0.5		0.5
Chloroform	67-66-3		0.68	8		8	355	3.9	B2	3.9	3.9		3.9
cis-1,2-Dichloroethene	156-59-2		0.53	7		7	1281				7		7
Dichlorobromomethane	75-27-4		1.18	8		8	12807	3.7		3.7	3.7		3.7
Dichloromethane	75-09-2		0.08	0.5		0.5	1207	3571	B2	3571	0.5		0.5
Ethyl benzene	100-41-4		20	70		70	9084	92		92	70		70
Freon-12	75-71-8		1.49	100		100	23				23		23
m-Xylene	108-38-3		20			20	1010				20		20
o-Xylene	95-47-6		20			20	1195				20		20
p-Xylene	106-42-3		20			20	1031				20		20
Tetrachloroethene	127-18-4		0.18	0.5		0.5	141	315	B	315	0.5		0.5
Toluene	108-88-3		14.4	100		100	22168				100		100
trans-1,2-Dichloroethene	156-60-5		0.53	10		10	12807				10		10
Trichloroethene	79-01-6		0.13	0.5		0.5	7	18	A	18	0.5		0.5

* NA - TCLP results not available for this Site

** NA - Background not determined for this Site

*** NA - Lead not a COPC

Analyte	CAS	TYPE 2 - SOIL										Residential Soil RRS - higher of Type 1 and 2
		Rule 391-3-19-.07(7)(c): Least of Items 1-4 (and if not calculable, the higher of Table 2 Appendix III, background and DL)										
		Item 1 Type 1/2 SSL Protective of Groundwater	Item 2 RAGS Eqn 7 (NC)		Item 3 RAGS Eqn 6 (C)		Item 4 IEUBK***	Least of Items 1 - 4	Alternate, if NA		Type 2 RRS	
			Adult	Child	Adult	Child			Table 2, Appendix III	Bkg **		
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1,1,1-Trichloroethane	71-55-6	19	10658	2270				19			19	20
1,1,2-Trichloroethane	79-00-5	0.032	2.4	0.5231174	17	17		0.032			0.032	0.5
1,1-Dichloroethene	75-35-4	0.7	238	51				0.74			0.74	0.74
2-Butanone (MEK)	78-93-3	9.5	47534	9316				9.5			9.5	200
Acetone	67-64-1	33	192186	32905				33			33	400
Carbon tetrachloride	56-23-5	0.044	162	33	6.5	6.8		0.044			0.044	0.5
Chloroform	67-66-3	0.44	355	73	3.9	4.1		0.44			0.44	3.9
cis-1,2-Dichloroethene	156-59-2	0.41	1281	156				0.41			0.41	7
Dichlorobromomethane	75-27-4	0.43	12807	1564	3.7	3.9		0.43			0.43	3.7
Dichloromethane	75-09-2	0.38	1207	209	3571	2812		0.38			0.38	0.5
Ethyl benzene	100-41-4	16	9084	1758	92	94		16			16	70
Freon-12	75-71-8	31	23	5.0				5.0			5.0	23
m-Xylene	108-38-3	1.1	1010	215				1.1			1.1	20
o-Xylene	95-47-6	1.2	1195	254				1.2			1.2	20
p-Xylene	106-42-3	1.1	1031	220				1.1			1.1	20
Tetrachloroethene	127-18-4	0.17	141	29	315	326		0.17			0.17	0.5
Toluene	108-88-3	14	22168	3581				14			14	100
trans-1,2-Dichloroethene	156-60-5	2.0	12807	1564				2.0			2.0	10
Trichloroethene	79-01-6	0.036	6.6	1.4	18	19		0.036			0.036	0.5

* NA - TCLP results not available for thi

** NA - Background not determined fo

*** NA - Lead not a COPC

Table L. Soil Non-Residential Risk Reduction Standards

Analyte	CAS	TYPE 3 SOIL														
		Item 1: Rule 391-3-19-.07(8)(d)1.						Item 2: Rule 391-3-19-.07(8)(d)2						Alternate if NA	Type 3 SS (<2') RRS: Lower of Items 1 and 2, if NA then Bkg or DL	Type 3 SB (>2') RRS: Item 1, , if NA then Bkg or DL
		(i): Item 1 of Rule 391-3-19-.07(6)(c)			(ii)	(iii)	Item 1: Highest of (i), (ii) and (iii)	(i)	(ii)			(iii)	Item 2: Lowest of (i), (ii) and (iii)	Bkg **		
		Appendix I (NC) - exclude []	Table 1 GW x 100 factor	TCLP*	Table 2 of Appendix III	Lead* **		RAGS Eqn. 7 Worker NC	RAGS Eqn. 6 Worker C	Cancer Class	Adjusted Eqn 6 Worker C	Lead* **				
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1,1,1-Trichloroethane	71-55-6	5.44	20				20	11253		D			11253		20	20
1,1,2-Trichloroethane	79-00-5	0.5	0.5				0.5	2.6	22	C	220		2.6		0.5	0.5
1,1-Dichloroethene	75-35-4	0.36	0.7				0.7	251		C			251		0.7	0.7
2-Butanone (MEK)	78-93-3	0.79	200				200	54429					54429		200	200
Acetone	67-64-1	2.74	400				400	259970					259970		400	400
Carbon tetrachloride	56-23-5	0.17	0.5				0.5	178	8.4	B2	8.4		8.4		0.5	0.5
Chloroform	67-66-3	0.68	8				8	387	4.9	B2	4.9		4.9		4.9	8
cis-1,2-Dichloroethene	156-59-2	0.53	7				7	4088					4088		7	7
Dichlorobromomethane	75-27-4	1.18	8				8	40880	4.7		4.7		4.7		4.7	8
Dichloromethane	75-09-2	0.08	0.5				0.5	1605	6625	B2	6625		1605		0.5	0.5
Ethyl benzene	100-41-4	20	70				70	10541	122		122		122		70	70
Freon-12	75-71-8	1.49	100				100	24					24		24	100
m-Xylene	108-38-3	20					20	1066					1066		20	20
o-Xylene	95-47-6	20					20	1263					1263		20	20
p-Xylene	106-42-3	20					20	1088					1088		20	20
Tetrachloroethene	127-18-4	0.18	0.5				0.5	152	409	B	409		152		0.5	0.5
Toluene	108-88-3	14.4	100				100	32801					32801		100	100
trans-1,2-Dichloroethene	156-60-5	0.53	10				10	40880					40880		10	10
Trichloroethene	79-01-6	0.13	0.5				0.5	7.1	24	A	24		7.1		0.5	0.5

* NA - TCLP results not available for this Site

** NA - Background not determined for this Site

*** NA - Lead not a COPC

SS: Surface Soil (0-2 ft) SB: Subsurface Soil (> 2ft)

Analyte	CAS	Type 4 Soil									Non-Reidential SS	Non-Residential SB
		Item 1: Rule 391-3-19.-07(9)(d)	Item 2: Rule 391-3-19.-07(9)(d)				Alternate, if NA		Type 4 SS RRS: Lesser of Items 1 and 2	Type 4 SB RRS: Item 1		
		Type 3/4 SSL Protection of Groundwater	(i) RAGS Eqn.7 Worker NC	(ii) RAGS Eqn. 6 Worker C	(iii) Lead ***	Item 2: Lowest of (i),(ii) and (iii)	Table 2, Appendix III	Bkg **	if NA highest of Table 2 Appendix III, Bkg or DL			
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1,1,1-Trichloroethane	71-55-6	96	11253			11253			95.54488	95.5448772	95.544877	95.544877
1,1,2-Trichloroethane	79-00-5	0.032	2.6	22		2.6			0.032441	0.03244086	0.5	0.5
1,1-Dichloroethene	75-35-4	3.8	251			251			3.762387	3.76238691	3.7623869	3.7623869
2-Butanone (MEK)	78-93-3	49	54429			54429			49.34556	49.3455598	200	200
Acetone	67-64-1	187	259970			259970			186.9189	186.918946	400	400
Carbon tetrachloride	56-23-5	0.079	178	8.4		8.4			0.07942	0.07942022	0.5	0.5
Chloroform	67-66-3	0.44	387	4.9		4.9			0.443264	0.44326381	4.8849089	8
cis-1,2-Dichloroethene	156-59-2	1.2	4088			4088			1.202268	1.20226797	7	7
Dichlorobromomethane	75-27-4	0.43	40880	4.7		4.7			0.434209	0.43420884	4.7057797	8
Dichloromethane	75-09-2	2.3	1605	6625		1605			2.319498	2.31949829	2.3194983	2.3194983
Ethyl benzene	100-41-4	16	10541	122		122			15.6936	15.6935996	70	70
Freon-12	75-71-8	31	24			24			24.39622	30.8027835	24.396221	100
m-Xylene	108-38-3	5.6	1066			1066			5.624256	5.62425639	20	20
o-Xylene	95-47-6	5.7	1263			1263			5.669729	5.66972882	20	20
p-Xylene	106-42-3	5.6	1088			1088			5.61837	5.61837003	20	20
Tetrachloroethene	127-18-4	0.89	152	409		152			0.89185	0.89185007	0.8918501	0.8918501
Toluene	108-88-3	73	32801			32801			72.5404	72.5403985	100	100
trans-1,2-Dichloroethene	156-60-5	13	40880			40880			12.81376	12.8137618	12.813762	12.813762
Trichloroethene	79-01-6	0.037	7.1	24		7.1			0.037459	0.0374591	0.5	0.5

* NA - TCLP results not available for this
** NA - Background not determined for
*** NA - Lead not a COPC
SS: Surface Soil (0-2 ft) SB: Subsurfa

Table M. Summary of Groundwater Risk Reduction Standards

Analyte	Groundwater					
	Type 1 RRS mg/L	Type 2 RRS mg/L	Residential RRS mg/L	Type 3 RRS mg/L	Type 4 RRS mg/L	Non-Residential RRS mg/L
1,1,1-Trichloroethane	0.2	2.7	2.7	0.20	13.6	13.6
1,1,2,2-Tetrachloroethane	0.0002	0.0009	0.0009	0.0002	0.0013	0.0013
1,1,2-Trichloroethane	0.005	0.0001	0.005	0.005	0.0006	0.0050
1,1-Dichloroethane	4.0	0.032	4.0	4.0	0.0464	4.0
1,1-Dichloroethene	0.007	0.10	0.10	0.007	0.52	0.52
1,2-Dichloroethane	0.005	0.0020	0.005	0.005	0.0029	0.005
1,2-Dichloropropane	0.005	0.0024	0.005	0.005	0.0074	0.0074
2-Butanone (MEK)	2.0	2.3	2.3	2.0	12	12
4-Methyl-2-pentanone	2.0	1.8	2.0	2.0	8.8	8.8
Acetone	4.0	8.0	8.0	4.0	46	46
Benzene	0.005	0.0054	0.0054	0.005	0.0087	0.0087
Bromoform	0.08	0.038	0.080	0.080	0.062	0.080
Carbon disulfide	4.0	0.33	4.0	4.0	1.7	4.0
Carbon tetrachloride	0.005	0.0057	0.0057	0.005	0.01022	0.01022
Chloroform	0.08	0.0026	0.080	0.080	0.0034	0.080
Chloromethane	0.003	0.054	0.054	0.003	0.26	0.26
cis-1,2-Dichloroethene	0.07	0.031	0.070	0.070	0.20	0.20
Dibromochloromethane	0.08	0.010	0.080	0.080	0.034	0.080
Dichlorobromomethane	0.08	0.0016	0.080	0.080	0.002	0.080
Dichloromethane	0.005	0.074	0.074	0.005	0.45	0.45
Ethyl benzene	0.70	0.019	0.7	0.7	0.029	0.7
Freon-12	1.0	0.058	1.0	1.0	0.29	1.0
Isopropylbenzene	Bkg/DL	0.21	0.21	Bkg/DL	1.0	1.0
m-Xylene	Bkg/DL	0.058	0.058	Bkg/DL	0.29	0.29
o-Xylene	Bkg/DL	0.058	0.058	Bkg/DL	0.29	0.29
p-Xylene	Bkg/DL	0.058	0.058	Bkg/DL	0.29	0.29
Tetrachloroethene	0.005	0.019	0.019	0.005	0.098	0.098
Toluene	1	0.88	1	1	5.2	5.2
trans-1,2-Dichloroethene	0.1	0.31	0.31	0.1	2.0	2.0
Trichloroethene	0.005	0.0010	0.005	0.005	0.0052	0.0052
Vinyl chloride	0.002	0.0011	0.002	0.002	0.0033	0.0033
Xylenes	10	0.058	10	10	0.29	10

Residential RRS: Higher of Type 1 and Type 2
NonResidential RRS: Higher of Type 3 and Type 4

Table N. Summary of Soil Risk Reduction Standards

Analyte	Soil								
	Type 1 RRS mg/kg	Type 2 RRS mg/kg	Residential RRS mg/kg	Type 3 RRS		Type 4 RRS		Non-Residential RRS	
				SS mg/kg	SB mg/kg	SS mg/kg	SB mg/kg	SS mg/kg	SB mg/kg
1,1,1-Trichloroethane	20	19	20	20	20	96	96	96	96
1,1,2-Trichloroethane	0.5	0.032	0.5	0.5	0.5	0.032	0.032	0.5	0.5
1,1-Dichloroethene	0.7	0.74	0.74	0.7	0.7	3.8	3.8	3.8	3.8
2-Butanone (MEK)	200	9.5	200	200	200	49	49	200	200
Acetone	400	33	400	400	400	187	187	400	400
Carbon tetrachloride	0.5	0.044	0.5	0.5	0.5	0.079	0.079	0.5	0.5
Chloroform	3.9	0.44	3.9	4.9	8	0.44	0.44	4.9	8.0
cis-1,2-Dichloroethene	7	0.41	7	7	7	1.2	1.2	7.0	7.0
Dichlorobromomethane	3.7	0.43	3.7	4.7	8.0	0.43	0.43	4.7	8.0
Dichloromethane	0.5	0.38	0.5	0.5	0.5	2.3	2.3	2.3	2.3
Ethyl benzene	70	16	70	70	70	16	16	70	70
Freon-12	23	5.0	23	24	100	24	31	24	100
m-Xylene	20	1.1	20	20	20	5.6	5.6	20	20
o-Xylene	20	1.2	20	20	20	5.7	5.7	20	20
p-Xylene	20	1.1	20	20	20	5.6	5.6	20	20
Tetrachloroethene	0.5	0.17	0.5	0.5	0.5	0.89	0.89	0.89	0.89
Toluene	100	14	100	100	100	73	73	100	100
trans-1,2-Dichloroethene	10	2.0	10	10	10	13	13	13	13
Trichloroethene	0.5	0.036	0.5	0.5	0.5	0.037	0.037	0.5	0.5

Residential RRS: Higher of Type 1 and Type 2
Non-Residential RRS: Higher of Type 3 and Type 4
SS: Surface Soil (<= 2ft)
SB: Subsurface Soil (> 2ft)

APPENDIX G
Off-Property VI Risk Evaluations

APPENDIX G

SCREENING OF OFF-PROPERTY VAPOR INTRUSION

TABLE OF CONTENTS

LIST OF FIGURES

G1 BACKGROUND

In September 1988, a subsurface release of reclaimed trichloroethene (TCE) was discovered by Rheem at the company's property located at 138 Roberson Mill Road, Milledgeville, Georgia (Property) and reported to the Georgia Environmental Protection Division (EPD). The release occurred in the tank farm area from underground piping connecting two aboveground TCE storage tanks to a parts washer inside the Facility. Post discovery of the TCE release, Rheem installed a groundwater recovery system in 1989-90, which is still in operation, to recover TCE in groundwater. In 2010, groundwater delineation activities identified TCE off and southwest of the Property, prompting an investigation to determine the limits and condition of the TCE detected off-Property. Also in response to the discovery of TCE off-Property, Rheem installed a groundwater remediation system at the southwest Property line in 2012 to mitigate further off-Property transport of TCE.

The occurrence of TCE in off-Property groundwater initiated an assessment of potential exposure routes to current or future off-Property occupants to determine if any exposure pathways are potentially complete (*i.e.* if exposure to the TCE is reasonably possible). One route of potential exposure to the TCE is via inhalation of vapors, *i.e.* vapor intrusion (VI). VI is assessed herein based on an evaluation of the exposure pathway (complete vs. incomplete) and potential risk if an exposure route is assumed to be complete.

To assess the VI exposure route, this review included an evaluation of the off-Property groundwater conceptual site model (CSM) with respect to the TCE and assessed measured groundwater TCE concentrations with respect to U.S. Environmental Protection Agency (EPA) sanctioned VI models.

G2 OFF-PROPERTY GROUNDWATER CSM

Figure 1 provides the estimated extent of the off-Property TCE groundwater plume. Delineation of the off-Property TCE has been performed both laterally and vertically, with vertical testing of groundwater performed with packer units during well construction. The extent of the TCE is delineated to the northwest by MW-35, MW-45 and MW-54, and to the south and southwest by MW-44 and MW-36.

Four of the seven off-Property monitoring well locations (MW-33, MW-34, MW-35 and MW-36) were vertically delineated with discrete interval groundwater sampling (packer unit sampling), with completion of a monitoring well corresponding to the depth interval at which TCE was detected. A fifth off-Property location (WB-3) was also evaluated with discrete interval sampling near the Rheem Property line, but was not completed with a monitoring well. The remaining four off-Property monitoring wells (MW-43, MW-44, MW-45 and MW-54) were constructed by boring to top of competent bedrock and installing a monitoring well at the partially weathered rock (PWR)-bedrock interface.

TCE was detected at one or more discrete interval in three of the five off-Property borings vertically assessed (Figure 1). The boring nearest the Rheem Property line, WB-3, reported TCE in the more shallow sample interval at 47 feet below ground surface (ft-bgs) to 57 ft-bgs. Farther from the Rheem property line, near Roberson Mill Road, detection of TCE occurred at 137 ft-bgs (MW-33), and west of Roberson Mill Road detection of TCE occurred at 147 ft-bgs (MW-34). TCE detection in borings MW-33 and MW-34 are limited to the PWR zone immediately above bedrock and both locations exhibited clean groundwater in the shallow aquifer, with the clean water lens ranging from 43 feet (MW-33) to 50 feet (MW-34) thick. Two borings, MW-35 and MW-36, did not report TCE at any interval, including the PWR-bedrock interface zone. Data collected to date indicates the TCE is primarily tracing the PWR-bedrock interface, which typically represents the most transmissive zone in the regional Piedmont geology.

G3 OFF-PROPERTY VAPOR INTRUSION PATHWAY

At sites in which groundwater is the potential vapor source, as is the case off of the Rheem Property, the distribution of chemicals in the aquifer defines the potential exposure route. Groundwater with the volatile organic compound (VOC) distribution positioned at the water table allows for exchange or partitioning of the constituents to the overlying soil gas, with potential migration of soil gas to the surface. For groundwater with the VOC distribution occurring deep in the aquifer, with clean water overlying the constituents, transport of chemical vapors is obstructed to the overlying surface soil, placing a discontinuity in the VI pathway. This condition or discontinuity in the VI pathway is outlined in the EPA VI guidance as follows, "If vapor-forming chemicals are not present in the upper reaches (*e.g.*, within the uppermost foot) of the groundwater table (*e.g.*, due to the presence of an overlying zone of clean water from recharge; *i.e.*, "fresh water lens"), vapor transport to the overlying vadose zone will be impeded due to the slower diffusion of volatile chemicals in water than in soil gas". This condition holds true for the off-Property TCE plume, with only groundwater near the property where WB-3 is located exhibiting TCE potentially in the upper reaches of the water table and thus providing a potentially complete pathway for VI. Further from the Property, *e.g.*, near and west of Roberson Mill Road, the VI pathway is interrupted by the presence of a substantial clean water lens at the water table.

Based on the off-Property CSM for the TCE detected in groundwater, the VI pathway adjacent to and west of Roberson Mill Road is incomplete due to the discontinuity in the vertical distribution of TCE in groundwater. East of Roberson Mill Road the VI pathway is potentially complete as TCE is reported in the shallow groundwater zone evaluated, therefore screening of the groundwater condition and modeling of potential risk is warranted east of Roberson Mill Road.

G4 VAPOR INTRUSION SCREENING

G4.1 Screening Tools

Two EPA VI assessment tools were applied to evaluate risk to a hypothetical residential and commercial property occupant from TCE in groundwater off- Property - the EPA Vapor Intrusion Screening Level (VISL) calculator and the Johnson & Ettinger Model (JEM). The VISL calculator is a baseline assessment tool that reflects conservative model inputs and exposure assumptions to predict a reasonable worst-case condition for the purpose of screening sites between those that are unlikely to pose and those that may potentially pose a risk through the VI pathway. Sites in which media-specific VOC concentrations are reported above VISL screening values generally require further evaluation of the VI pathway, including more detailed modeling that is specific to site conditions. The JEM suits the detailed modeling objective by assessing the VI pathway with respect to general site conditions including site geology, hydrogeology and building construction, with the remainder of model parameters set to conservative values (central tendency or upper bound values). The JEM model in this assessment utilized general site conditions to reverse-calculate an "acceptable" groundwater concentration for a defined range of risk.

G4.2 Model Screening Values

VISL and JEM screening values were determined for residential and commercial land use scenarios, and for an excess Target Cancer Risk (TCR) of 10^{-5}. The JEM was evaluated for a groundwater TCE condition 25 ft-bgs to conservatively represent area hydrogeology and a worst-case scenario in which the current TCE condition occurs at the water table, a condition that may only occur near the Rheem Property line and not near Roberson Mill Road. Additional parameters assigned in the JEM to refine the model to site-specific conditions include: (1) setting the groundwater temperature to 20° C, (2) setting site soil type to sandy clay and (3) setting the building type to slab-on-grade construction. The VISL and JEM screening values are summarized below:

VI Screening Values by Land Use (TCR=10^{-5})

	Residential	Commercial
VISL	6.6 µg/L	28 µg/L
JEM Model (25 feet)	354 µg/L *	495 µg/L *

*Screening value based on a Hazard Quotient of 1.0, which is lower than the TCE of 10^{-5}.

G5 OFF-PROPERTY ASSESSMENTS

G5.1 Off-Property Soil Gas Assessment

A shallow soil gas sample was paired with off-Property well MW-54 in January 2016 to assess for TCE. The groundwater sample collected from MW-54 did not report TCE or other VOCs, but did report a detection for dichloromethane (8.3 µg/L) slightly above its detection limit (5.0 µg/L). The paired shallow soil gas sample reported several VOCs including: PCE (200 µg/m^3), chloroform (37 µg/ m^3), acetone (33 µg/ m^3), toluene (23 µg/ m^3), 1,2,4-trimethylbenzene (15 µg/ m^3), m&p xylene, (13 µg/ m^3), o-xylene (5.5 µg/ m^3) and chloromethane (4.6 µg/ m^3). All detected soil gas constituents are below VISL screening values (TCR=10^{-6}) for residential exposure with the exception of chloroform, which falls between a TCR=10^{-5} (41 µg/ m^3) and TCR=10^{-6} (4.1 µg/ m^3).

G5.2 Summary of Off-Property Groundwater

A summary of off-Property groundwater east of Roberson Mill Road is provided below and used for comparison to the modeled VI screening values. Four locations are available for the tract east of Roberson Mill Road: WB-3, MW-33, MW-43 and MW-54. Boring WB-3 has reported a TCE concentration at the shallow groundwater sample interval (47 to 57 ft-bgs) of 78 µg/L. The next deeper interval (87 to 108 ft- bgs) and nearer the PWR bedrock interface reports a TCE concentration of 250 µg/L, which supports the PWR zone as the prevailing route of TCE transport. The average TCE concentrations in MW-33 (over the past 5 years) and MW-43 (over the past three years) are 83.8 µg/L and 156 µg/L, respectively. TCE has not been detected in MW-54 (130 to 140 ft-bgs).

Groundwater TCE and Groundwater Depth for
Off-Property Monitoring Wells East of Roberson Mill Road

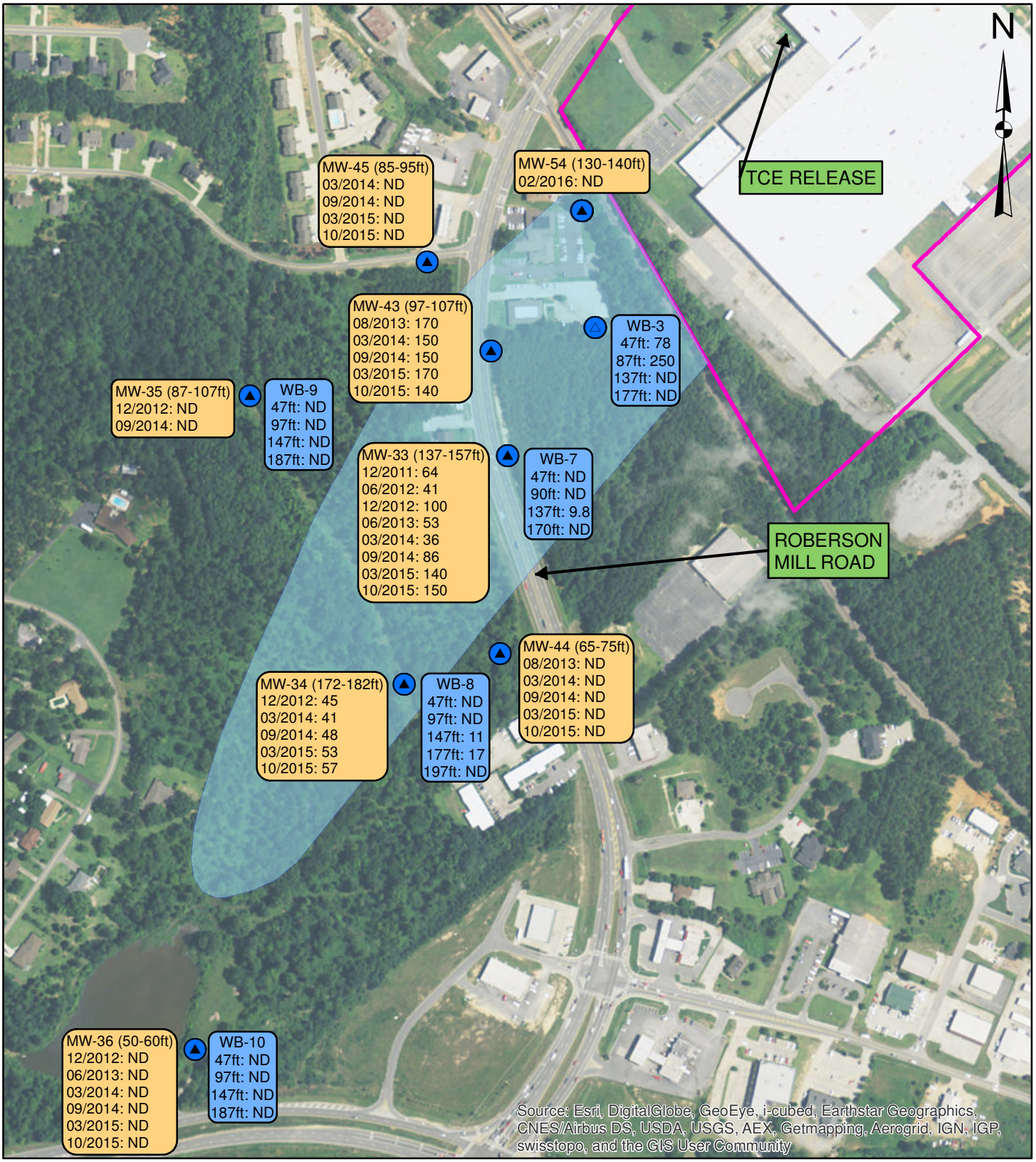
	MW-33	**MW-43**	**WB-3**
Sampler Interval (ft-bgs)	137-157	97-107	47 - 57
Depth (ft) to Groundwater	31.2	28.2	26
# Samples	8	5	1
Minimum	36.0 µg/L	140 µg/L	--
Maximum	150 µg/L	170 µg/L	78 µg/L
Average	83.8 µg/L	156 µg/L	78 µg/L

G6 VI MODEL RISK SUMMARY

An incomplete pathway for VI exists for the groundwater condition west of Roberson Mill Road as the TCE is present beneath a substantial (> 40 ft) clean water lens. Off-Property groundwater TCE concentrations east of Roberson Mill Road are above the range of commercial and residential VISL screening that apply at the point of exposure. Therefore, a comparison of off-Property TCE conditions to area specific JEM screening values was performed to assess potential risk. In addition, comparison of off-Property TCE concentrations to JEM screening values indicates that the properties adjacent to and east of Roberson Mill Road exhibit groundwater TCE concentrations that are below the screening value of 10^{-5} for both residential and commercial land use. Thus, it is concluded that VI risk based on off-Property groundwater conditions is negligible.

FIGURES

Rheem Manufacturing Plant
Off-Property Groundwater Assessment and Delineated Extent of TCE in Groundwater



0 100 200 400
Feet

Monitoring Well

Assessment Boring
(monitoring well not installed)

Inferred Off-Site TCE Plume

Property Line

Monitoring Well Data Summary

Well ID (Screen Interval, ft)
Sample Date: TCE (mg/L)

Boring Interval Sampling Data

Well Boring ID
Depth, ft: TCE (mg/L)

Environmental Planning Specialists, Inc.

Figure No.1

APPENDIX H
On-Property Groundwater Remediation Strategy

EPS

APPENDIX H

ON-PROPERTY GROUNDWATER REMEDIATION STRATEGY FOR TCE RELEASE AREA AND PLUME

TABLE OF CONTENTS

LIST OF FIGURES

ATTACHMENTS

H1 INTRODUCTION

H1.1 Background

Since 1991, the Rheem Manufacturing Company ("Rheem") has performed groundwater pump-and-treat ("P&T") in response to a release of the volatile organic compound ("VOC") trichoroethene ("TCE") at the former Rheem manufacturing facility land parcel No. M52 001 ("Property") located in Milledgeville, Georgia. The P&T system is comprised of four groundwater recovery wells and a central air-stripper treatment system. In 2012, Rheem implemented a second remedial technology developed by Accelerated Remediation Technologies, LLC ("ART") to address the groundwater VOC plume, which was identified in 2011 to extend off-Property to the southwest of the property. The ART technology combines *in situ* air stripping, air sparging, soil vapor extraction and subsurface circulation and flushing. The system was initially comprised of two remediation wells installed at the property line and operated as a pilot program to assess the technology. Based on the pilot program Rheem installed three additional remediation wells (for a total of 5 remediation wells) at the property line in July 2013. The current system has operated for over two years and a final expansion of the system was implemented in April-May in 2016 as part of the overall Site groundwater strategy as described herein.

H1.2 Frame of Reference (Regulatory Framework)

Consent Order Number EPD-HW-667 executed on September 26, 1991 provided the initial regulatory framework for the groundwater corrective action at the Site until it was superseded by Consent Order Number EPD-VRP-007 executed on October 18, 2013. The original Order mandated operation of the groundwater P&T system. The new Order accepts the Site into the Georgia Voluntary Remediation Program ("VRP") and it recognizes the Voluntary Investigation and Remediation Plan ("VIRP")[1]. Appendix H to the VIRP identified anticipated future remedial action measures stating the following:

> "The current P&T system is not considered a comprehensive long-term remedial option as it will not address the vadose zone soils and is not expected to sufficiently capture all the TCE impacted groundwater migrating to the west/southwest. However, the current system or variation of the system may be used in conjunction with other remedial action options subject to the forthcoming technology review and evaluation."

[1] The VIRP is comprised of the updated VRP Application dated October 10, 2012 (EPS, 2012), and a supplement to the application (Appendix H) dates April 17, 2013 (EPS, 2013).

H1.3 Recent Activity Performed in Support of the Technology Review

This document presents an updated review of the remedial action strategy and technology options for the Site groundwater, in accordance with a final Voluntary Investigation and Remediation Plan ("VIRP") presented in Progress Report #5. To support the technology review, Rheem has performed an analysis of the P&T system effectiveness, assessed the aquifer's physical and chemical properties with respect to *in situ* chemical oxidation ("ISCO") and performed a two-month in-well treatability study for *in situ* bioremediation. The details of these studies are provided in Section 2.

The remainder of this report serves to outline the area-specific strategies and supporting information Rheem intends to act upon to accomplish meaningful reduction of VOCs in on-Property groundwater and mitigate future transport of VOCs off-Property. The report is organized as follows:

Section 2. technology review;
Section 3. *in situ* bioremediation and implementation plan;
Section 4. adaptation of the existing P&T system to support *in situ* bioremediation;
Section 5. a review of the property line remediation design and expansion to optimize the system performance; and
Section 6. references.

H2 TECHNOLOGY REVIEW

H2.1 Background

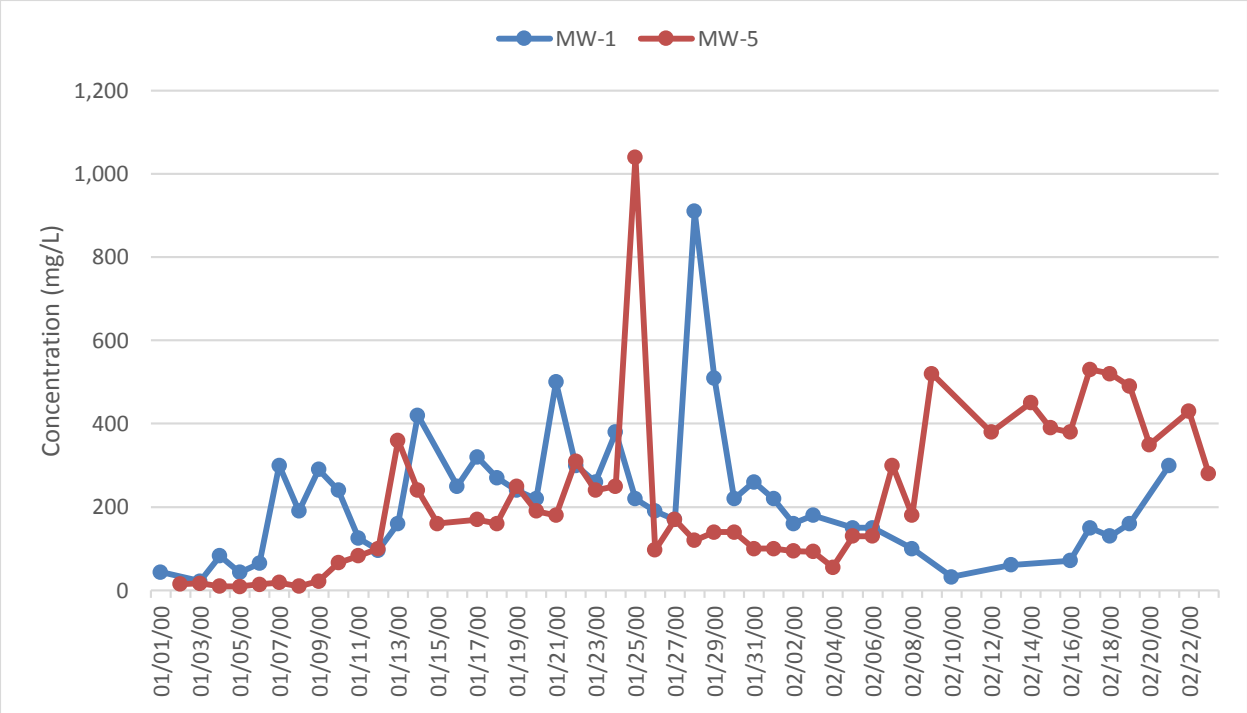
Rheem has completed a technology review and performed supplemental field activities to support the selection of an improved remedial action strategy to supplement the P&T strategy for the Site groundwater, and for an expansion of the property line system to address off-Property migration of VOCs. Review examined technologies designed to achieve TCE mass reduction in the area of the TCE release, where TCE is likely present as a residual dense nonaqueous phase liquid ("DNAPL"), and in the TCE plume core where considerable sorbed-phase TCE mass is expected to occur. The review also examines improvements to the recently implemented ART remediation approach designed to address off-Property flux of TCE. The ART system is a temporary measure to control the off-Property flux of TCE until release area TCE remediation is achieved.

H2.2 Release Area Groundwater Technology Review

H2.2.1 Pump & Treat Review

The P&T system installed pursuant to the original Consent Order has been in operation for 24 years providing adequate data to assess the technology and its anticipated long-term effectiveness. The effectiveness of the P&T system was assessed with respect to VOC mass removal and second, control of TCE migration away from the Site. VOC mass removal is being accomplished with the current P&T system, but groundwater data indicates the rate of mass removal is insufficient to mitigate the overall groundwater condition in a reasonable or cost-effective time-frame. This is illustrated below for MW-1 and MW-5, both located in the TCE release area, with TCE concentrations maintaining an overall elevated condition during the period of P&T operation. This outcome and supporting data is consistent with the generally recognized limitation of P&T technology when applied to remedial action for DNAPL that exhibit sparing solubility (ITRC, 2002). Anticipated project lifetimes for P&T systems according to the Interstate Regulatory Technology Council ("ITRC") report are on the order of 100 years when addressing residual DNAPL, due to limited mass transport (*i.e.* limited dissolution of adsorbed or residual DNAPL into groundwater). The second purpose of the P&T system, hydraulic control of the dissolved VOC plume, is also considered inadequate as TCE has migrated off-Property to the southwest. Rheem responded to the latter issue with the installation of the ART remediation wells at the down-gradient property line, minimizing further off-Property TCE flux.

Trichloroethene Concentrations in Release Area Groundwater



In view of the original objectives of the P&T system and anticipated system lifetime, the P&T system is not considered a long-term feasible technology to manage groundwater in the TCE release area.

H2.2.2 ISCO Review

ISCO is a common remedial technology for TCE with well established engineering design parameters that can be adapted to various project settings and conditions, including more recent technology advancements to address residual DNAPL conditions. The feasibility of ISCO was examined for the Rheem Site through soil oxidant demand ("SOD") treatability testing and modeling the oxidant mass required for the release area. The outcome of this model was an excessive quantity of permanganate, on the order of 2,000,000 pounds based on a Site-specific SOD of 2.6 grams per kilogram (g/kg). Not only would the cost be exorbitant, this approach would pose challenges in the terms of timeframe and infrastructure necessary to deliver this amount of oxidant.

H2.2.3 *In Situ* Bioremediation Review

H2.2.3.1 Overview of the Remediation Technology

As outlined in the ITRC publication *Overview of In Situ Bioremediation of Chlorinated Ethene DNAPL Source Zones* (ITRC, 2005), *in situ* bioremediation is the use of biostimulation (*i.e.* addition of an organic substrate and nutrients into groundwater to stimulate and sustain beneficial microorganisms) and/or bioaugmentation (*i.e.* the addition of beneficial microorganisms, *i.e.*

Dehalococcoides) to create anaerobic conditions in groundwater to promote contaminant degradation (*i.e.* reductive dechlorination) for the purpose of accelerating contaminant mass removal. Historically, this technology focused on addressing groundwater VOC plumes with less emphasis on VOC source area treatment. More recently, the benefit of implementing *in situ* bioremediation as a remedial strategy in source areas and at VOC solubility limits, has been recognized as a feasible technology on par with more standard technological approaches (ITRC, 2005). *In situ* bioremediation strategies have been successful for contaminant mass removal in DNAPL source zones for the reason that VOC degrading microorganisms, when sustained with an appropriate substrate (*i.e.* carbon source), rapidly remove dissolved phase VOCs thereby maintaining a sustained concentration gradient that is favorable for prolonged dissolution of VOC source material (*e.g*., adsorbed and free product) and overall mass reduction (Harkness and Fisher, 2013; Seagren *et al*., 1993; Yang and McCarty, 2000). The net result of a successful bioremediation strategy is a substantial decrease in the VOC source lifetime as demonstrated in laboratory and field projects (CL:AIRE, 2010). Examples where *in situ* bioremediation has been used in the State of Georgia to address VOC source area zones are provided below (note the list is limited to Sites which utilized the same commercial product as EPS utilized in the Rheem treatability study).

In Situ Bioremediation of VOC Source Areas in Georgia

Site	Year	Contaminants	Project Scale
Moody AFB, GA	2004	PCE, TCE, cDCE, VC	Full scale SRS® injection
Savannah Air National Guard GA	2009, 2010	PCE, TCE, cDCE, VC	Full scale SRS® injection
Cintas, Atlanta, GA	2011, 2012	Chlorinated solvents	Pilot SRS® injection
Winder, GA	2011	Chlorinated solvents	Full scale SRS® injection
Marietta, GA	2013	Chlorinated solvents	Full scale SRS® injection
Rome, GA	2013	Chlorinated solvents	Full scale SRS® injection

Based on the recent utilization and evidence of *in situ* bioremediation as a feasible technology for DNAPL source zone treatment, Rheem invested in a field pilot treatability study of the technology. The treatability study comprised of two in-well units that assesses Site-specific bioremediation potential and were deployed in monitoring wells in the release area groundwater (Figure 1). A summary of findings for the treatability study is provided below with complete treatability study results provided in Attachment A.

H2.2.3.2 Summary of Field Pilot Treatability Test

Three conclusions were drawn from the treatability study and provide a framework for bioremediation design for the Rheem Site.

1. Indigenous *Dehalococcoides* bacteria is present in Site groundwater, but the indigenous population varies from location to location. Groundwater at MW-1 exhibits a much lower concentration of *Dehalococcoides* in comparison to PZ-5.
2. Biostimulation improves the indigenous *Dehalococcoides* population and intrinsic degradation of TCE. The indigenous *Dehalococcoides* population at MW-1 was responsive to biostimulation, with a population increase of two order of magnitude during the study period.
3. Bioaugmentation resulted in strong expression of the reductase genes necessary for complete degradation of TCE to non-toxic endpoints.

The results of the two treatability study units illustrate an *in situ* bioremediation strategy is appropriate for the Site and effective for reducing COC mass in the release area groundwater if a combined biostimulation and bioaugmentation strategy is implemented. The survival of *Dehalococcoides* indicate Site groundwater and geochemical conditions are supportive to *Dehalococcoides* and no inhibitions to growth have been identified. The strategy, in addition to reducing VOC mass in groundwater as found in the treatability study, is also expected to accelerate contaminant mass removal for residual DNAPL likely present at the Site. As indicated, contaminant mass removal from DNAPL sources (*e.g.*, residual product and/or sorbed TCE) will be accelerated as dissolved COC constituents are degraded thereby imposing a concentration gradient favorable to enhanced and continued dissolution of TCE.

H2.2.4 TCE Release Area Remedial Technology

In situ bioremediation is selected as the remediation technology for TCE mass reduction in the area of the TCE release. Bioremediation implementation and design parameters are discussed in Section 3.

H2.3 Property Line Technology Review

H2.3.1 ART Technology

ART technology combines *in situ* air stripping, air sparging, and soil vapor extraction in a modified wellhead system. Within each well casing of the ART system, ambient air is sparged near the bottom of the well casing while simultaneously groundwater is pumped from the bottom of the casing to the wellhead, at which point it is dispersed with a spray head and allowed to cascade back to the water table. These actions together perform the function of a conventional air stripper as the dissolved phase VOCs are transferred to a gaseous phase and captured above ground in granular activated carbon canisters. The negative pressure imparted by the vacuum system and the pumping of groundwater from the bottom to the top of the well casing results in circulation of groundwater in the aquifer near the well promoting cycling of adjacent groundwater through the ART system to maximize the ART system radius of influence ("ROI") and TCE removal.

The performance of the ART system is assessed by monitoring groundwater VOC concentrations and geochemical parameters in downgradient monitoring wells. Groundwater VOC concentration

have decreased since inception of the ART system in 2012, with TCE groundwater concentrations at the property line decreasing 84% to 99% (EPS, 2015). In addition, the ART system has resulted in elevated concentrations of dissolved oxygen ("DO") and increased oxidation-reduction potential ("ORP") providing a direct line of evidence that the ART system is modifying groundwater along Rheem property line.

H2.3.2 System Background and Status

Pilot testing of the ART technology was initiated on October 25, 2012 with installation of two 4-inch diameter ART remediation wells, ART-1 and ART-2, which were installed on a 50-foot spacing northeast (hydraulically upgradient) of MW-27 and MW-28 (Figure 2). The initial pilot test did not attain the desired levels of VOC reduction and aquifer modification, with the limited performance determined to be a result of the ART remediation well construction. Specifically, the 4-inch diameter ART remediation wells limited air sparge rates and system vacuum to less than system design specifications. It was concluded that larger diameter ART wells would need to be installed and tested as an expansion to the pilot test.

Three additional ART remediation wells (ART-3, ART-4, and ART-5) were installed in July 2013 with 6-inch diameter casing, also on a 50-foot spacing. The new ART wells were placed in-line with ART-1 and ART-2, perpendicular to groundwater flow, with ART-4 placed between the initial ART well pair (ART-1 and ART-2), ART-3 placed northwest of ART-1, and ART-5 placed to the southeast of ART-2 (see Figure 2).

The expanded ART pilot test began on November 7, 2013, and involved operation of ART-3, ART-4 and ART-5. ART-1 and ART-2 were held in reserve to allow for assessment of the new ART well design and ART well placement (*i.e.* new well locations and 50-foot spacing). Follow-on testing of all ART wells operating concurrently (*i.e.* restart of ART-1 and ART-2) resulted no additional benefit in VOC reduction in comparison to the pilot period limited to ART-3, ART-4 and ART-5.

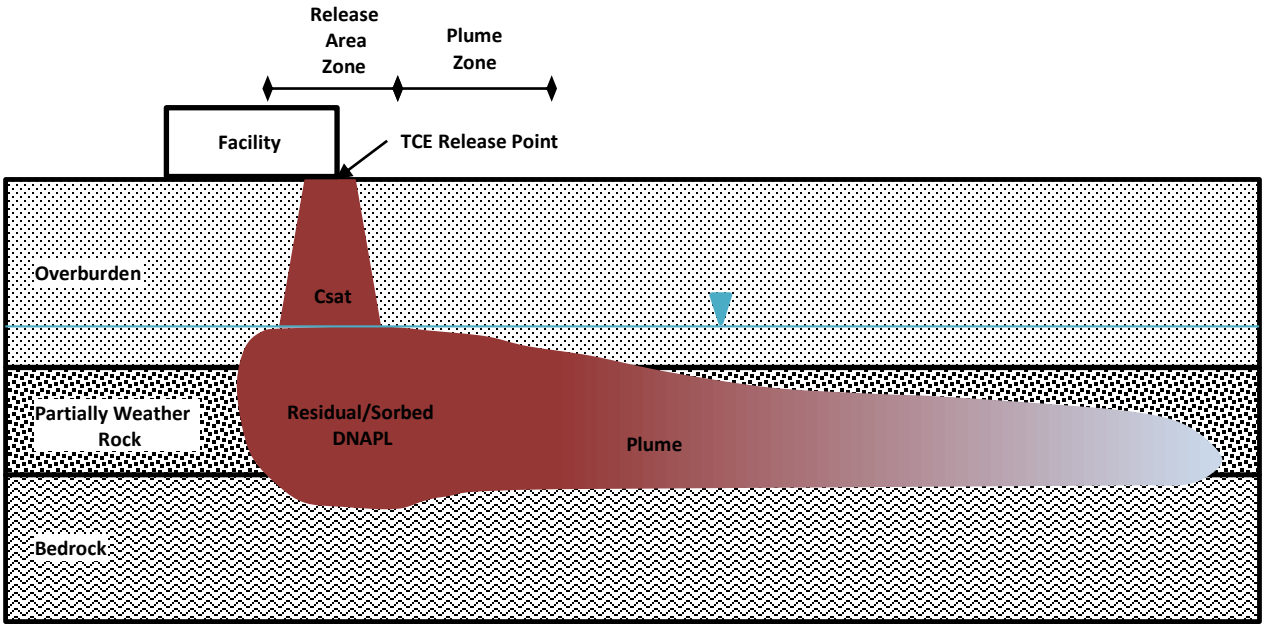
Based on the pilot and expanded pilot test trails and groundwater data results, the ART system design has been finalized and recently implemented with three additional ART remediation wells installed to the north of the ART-1 to ART-5 array of wells. The final ART well array spans over 200 linear feet along the down-gradient property line of Rheem, oriented perpendicular to the direction of groundwater flow providing a wide barrier to off-property flux of TCE in groundwater.

H3 BIOREMEDIATION IMPLEMENTATION AND DESIGN PARAMETERS

H3.1 Implementation Areas

Bioremediation will be implemented for two areas of the Site to address the core of the TCE impacted groundwater (*i.e.* the area beneath the TCE release area), referred to as the "Release Area Zone", and the down-gradient plume encompassing the more elevated TCE condition referred to as the a "Plume Zone" (Figure 3). Vertically, *in situ* bioremediation will be implemented within portions of or the entirety of these two zones spanning the most elevated TCE groundwater condition including groundwater in the overburden, the partially weathered rock ("PWR") and the top of bedrock (*e.g.*, the top 10 to 20 feet of fractured bedrock).

The described implementation areas are based on and consistent with the Conceptual Site Model ("CSM") and supporting TCE data for the Site. The CSM, as provided in the VRP application and schematically illustrated below, exhibits the characteristic behavior of a DNAPL release, with primarily vertical migration downward from the release point until the DNAPL encounters a low permeability zone (*e.g.*, bedrock), at which point DNAPL may saturate the aquifer pore space if sufficient DNAPL was released. The downward vertical migration of DNAPL leaves in its path residual product no longer capable of migrating as a pure phase, but acts as a continuing source of DNAPL constituents to groundwater. In the case of a significant release the residual phase will occur at the soil saturation concentration ("Csat"). Potentially the largest source of DNAPL according the CSM occurs at the interface of the low permeability zone, resulting in an elevated



groundwater condition at depth that exceeds the groundwater concentrations in the surficial aquifer. Site groundwater exhibits this property with respect to TCE.

As illustrated on Figure 4 shallow groundwater, that is groundwater less than 50 feet ("ft") below ground surface ("bgs"), exhibits elevated TCE primarily within the Release Area groundwater zone, but not within the down-gradient Plume Zone. Deeper groundwater, *i.e.* greater than 50 ft bgs, exhibits elevated TCE in both zones (Figure 5).

H3.2 Subsurface Placement of EVO and *Dehalococcoides*

H3.2.1 Injection Strategies - Overview

Two general strategies are used for placement of EVO and bioaugmentation culture in aquifers, application via injection wells or direct-push injection. Injection wells are advantageous when the bioremediation strategy involves large volumes of substrate or multiple substrate injection events over time. This implementation strategy is best suited to the region of residual DNAPL and heavy sorbed phase contamination, such as the Release Area Zone. Bioaugmentation application can also be done through direct injection and this implementation strategy offers the benefits of lower unit cost and added mobility (since the equipment is often less sizable and more maneuverable). Direct injection is also more cost effective in situations where additional maintenance injection are not likely. This implementation strategy will be used for the Plume Zone, as well as supplemental locations within the Release Area Zone, and will be performed using sonic drilling methods which offers the capability to advance the injection rods into the PWR and bedrock. Further details of the injection strategy in each of the two geographic zone follows.

H3.2.2 Release Area Zone

The strategy for the Release Area will encompass both methods of media placement. In the region of the former AST tank farm, injection well nests will be installed (Figure 6), with each nest constructed with vertically staggered screen sections to support placement of EVO and bioaugmentation culture across the full thickness of the aquifer. Installation of injection wells overcomes logistical limits imposed by the high infrastructure density in this area of the Site, as a greater radius of influence and larger injection volumes can be achieved with injection wells.

The remaining portion of the Release Are Zone will utilize a dense array of sonic drilling direct injection points, primarily within the interior of the facility. Each boring will be advance through the overburden and PWR zone and terminated approximately 20 feet into bedrock. Media injections will be performed at the boring termination and then every five feet as the sonic drill rod is withdrawn. Anticipated direct injection locations in the interior of the facility are shown on Figure 6.

H3.2.3 Plume Zone

The Plume Zone groundwater will be addressed with installation of two bioremediation injection transects ("biobarrier") oriented perpendicular to the direction of groundwater flow (Figure 6). The

objective of the biobarriers is to further reduce VOC mass originating from the VOC release area. Bioremediation media will be placed primarily in the PWR consistent with the TCE groundwater profile.

H3.3 Media Injection Design Parameters

H3.3.1 Biostimulation

Design parameters for biostimulation and bioaugmentation have been modeled for the proposed implementation areas. Organic substrate demand for the purpose of biostimulation was modeled with the *Substrate Estimating Tool for Enhanced Anaerobic Bioremediation of Chlorinated Solvents* developed under the Environmental Security Technology Certification Program (Parsons, 2010). The substrate estimating tool utilizes six Site-specific variable groups to determine the quantity of organic substrate to emplace in the affected aquifer including:

1. volume of aquifer to be treated;
2. concentration of competing electron acceptors;
3. concentration of COCs;
4. concentration of COC degradation products;
5. geochemical conditions; and
6. hydrogeologic properties.

The substrate planned for the use at the Site is an EVO sold under the trade name of SRS-SD® (Terra Systems, Inc.). The modeled substrate requirement was estimated based on a 3-year active period, *i.e.* sufficient organic substrate to maintain the proper population density of *Dehalococcoides* for approximately three years.

H3.3.2 Bioaugmentation

As illustrated by the treatability study, bioaugmentation or the addition of *Dehalococcoides* imparts a direct benefit on the capacity of *in situ* bioremediation for the Site. Terra Systems Inc. has determined the quantity of bioaugmentation culture for the selected aquifer treatment zones based on aquifer volume. As with the organic substrate, the culture will be distributed across the treatment zone with injection wells and direct injections during EVO placement.

H3.4 Bioremediation Monitoring and Maintenance

H3.4.1 Bioremediation Monitoring

Semi-annual sampling of treatment area groundwater will be performed to assess for EVO and the viability of *Dehalococcoides.* The concentration of EVO will be assessed by testing groundwater total organic carbon ("TOC") at existing monitoring wells. The viability and function of the augmented *Dehalococcoides* population will be assesses though annual Bio-Trap® deployment,

which will determine the concentration of *Dehalococcoides* in the aquifer and monitor for the genes required for complete reductive dechlorination of TCE to non-toxic end products.

H3.4.2 Maintenance Injections

Maintenance injections of EVO will be performed as needed to maintain a groundwater TOC concentration of approximately 100 mg/L. A threshold concentration of 100 mg/L TOC has been found to be effective for sustained reductive dechlorination of TCE (Parsons, 2010). EVO maintenance injections will be performed through the Release Area Zone injection wells or with direct push injections elsewhere as needed to maintain *Dehalococcoides* activity.

H4 PUMP & TREAT SYSTEM STATUS AND ADAPTATION

Rheem will phase out the existing P&T systemas *in situ* bioremediation is implemented to prevent extraction and disposal of bioremediation amendments (*e.g.*, EVO and culture). Modifications to the system will include the following:

1. Operation of RW-1 will be immediately discontinued. RW-1 is located in the area of the proposed bioremediation injection wells (Figure 7). Operation of RW-1 would result in extraction of injected biostimulation media and bioaugmentation culture, reducing the effectiveness and longevity of the bioremediation approach.
2. Operation of RW-2, RW-3 and RW-4 will continue to be operated in the near term. Operation of these three groundwater recovery wells will enhance the distribution of injected biostimulation substrate and bioaugmentation culture, as extraction of peripheral groundwater will pull the media outward into the aquifer.
3. It is anticipated that within the year or less following the bioaugmentation treatment, that operation of RW-2, RW-3 and RW-4 can be discontinued as the P&T system will be serving no viable remediation purpose at that time. Any remaining residual plume condition beyond the influence of the bioremediation would be addressed through a combination of monitored natural attenuation and the ART remediation along the Rheem property line (down gradient of the plume).

H5 PROPERTY LINE STRATEGY FOR VOC PLUME CONTROL

The final ART system array is illustrated in Figure 2 along the Rheem property line. To optimize the system treatment zone, ART-1 and ART-2 will be deactivated in favor of new ART wells recently installed to the northwest of the existing ART-3, for a total of six active ART wells. As provided in Section 2.3, no additional benefit was realized for the current treatment zone by operating ART-1 and ART-2 in addition to ART-3, ART-4 and ART-5. Thus ART-1 and ART-2 are redundant for the current treatment zone and the ART system infrastructure will be better utilized to support the expansion (3 new ART wells) northwest of ART-3 to intercept and treat a broader cross-section of groundwater.

H6 REFERENCES

CL:AIRE. (2010). Project SABRE: Source Area Bioremediation – Overview. Contaminated Land: Applications in Real Environments.

EPS Inc., (2012). Voluntary Remediation Program Application, Rheem Manufacturing Company, Milledgeville, Georgia (Update 1, October 2012).

EPS Inc., (2013). Supplement to Rheem Updated VRP Application.

EPS, Inc., (2015). Voluntary Remediation program Progress Report, Rheem Manufacturing Company, Milledgeville, Georgia. (May 2015).

Harkness, M. and Fisher, A. 2013. Use of emulsilfed vegetable oil to support bioremediation of TCE DNAPL in soil columns. Journal of Contaminant Hydrology. 151: 16-33.

Interstate Technology Regulatory Council. (2005). Overview of *In Situ* Bioremediation of Chlorinated Ethene DNAPL Source Zones.

Jerger, D.E., Skeen, R.S., Semprini, L, Leigh, D.P., and Grenade, S.. (1998). Scale-up for *In Situ* Bioremediation of Groundwater by Chlorinated Solvents. (www.wmsym.org/archives/1998/html/sess30/30-02/30-02.htm)

Parsons Infrastructure & Technology Group, Inc.. (2010). Loading Rates and Impacts of Substrate Delivery for Enhanced Anaerobic Bioremediation. Environmental Security Technology Certification Program, Project ER-200627.

Seagren, E.A., B.E. Rittmann, and A.J. Valocchi. 1994. "Quantitative Evaluation of the

Enhancement of NAPL-Pool Dissolution by Flushing Flushing and Biodegradation."

Environmental Science and Technology, 28:833-839.

Yang, Y. and P.L. McCarty. 2000. "Biologically Enhanced Dissolution of Tetrachloroethene

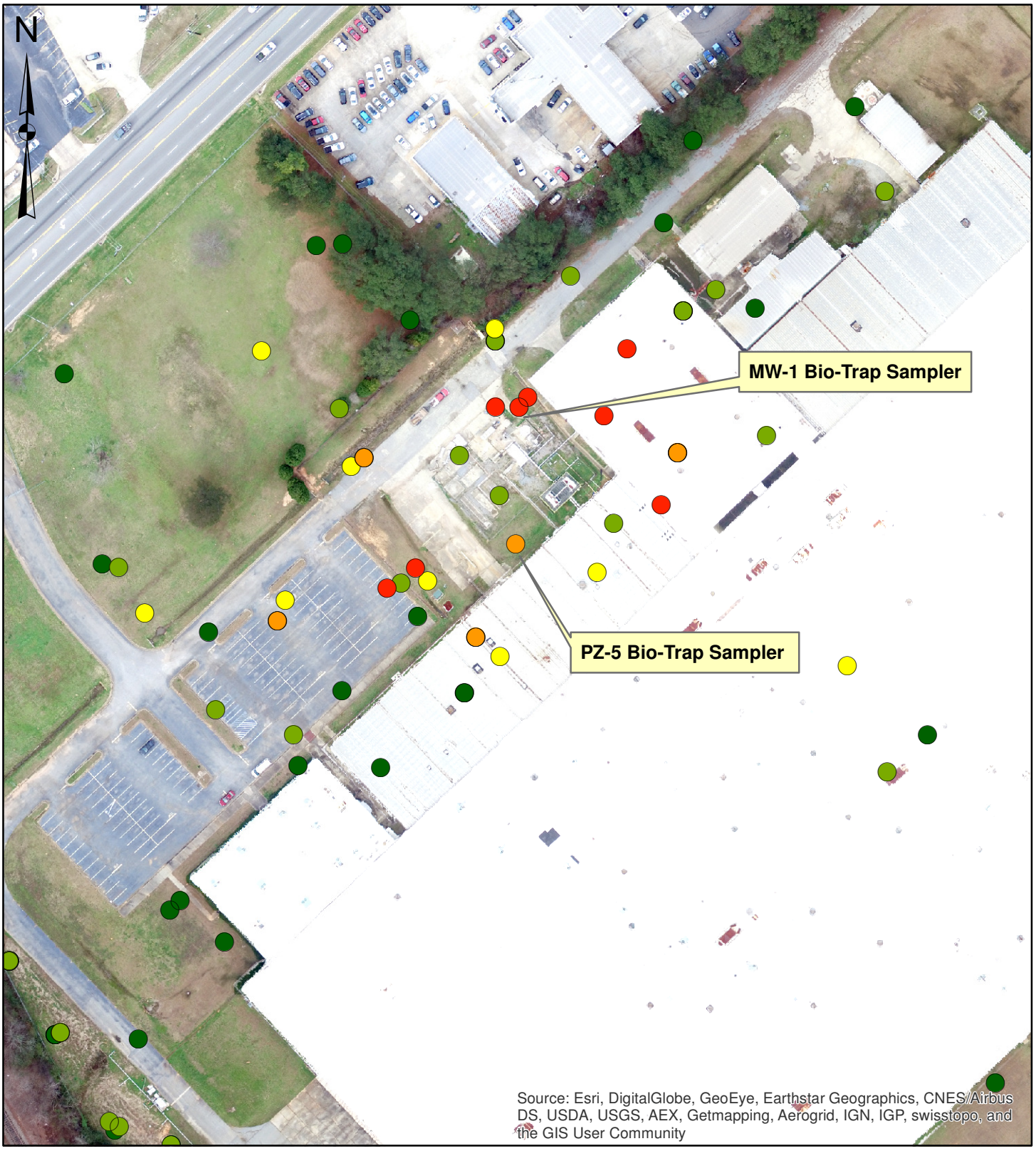
DNAPL." Environmental Science and Technology, 34(14):2979-2984.

(http://es.epa.gov/ncer_pubs/full_text/11879.pdf.)

FIGURES

EPS

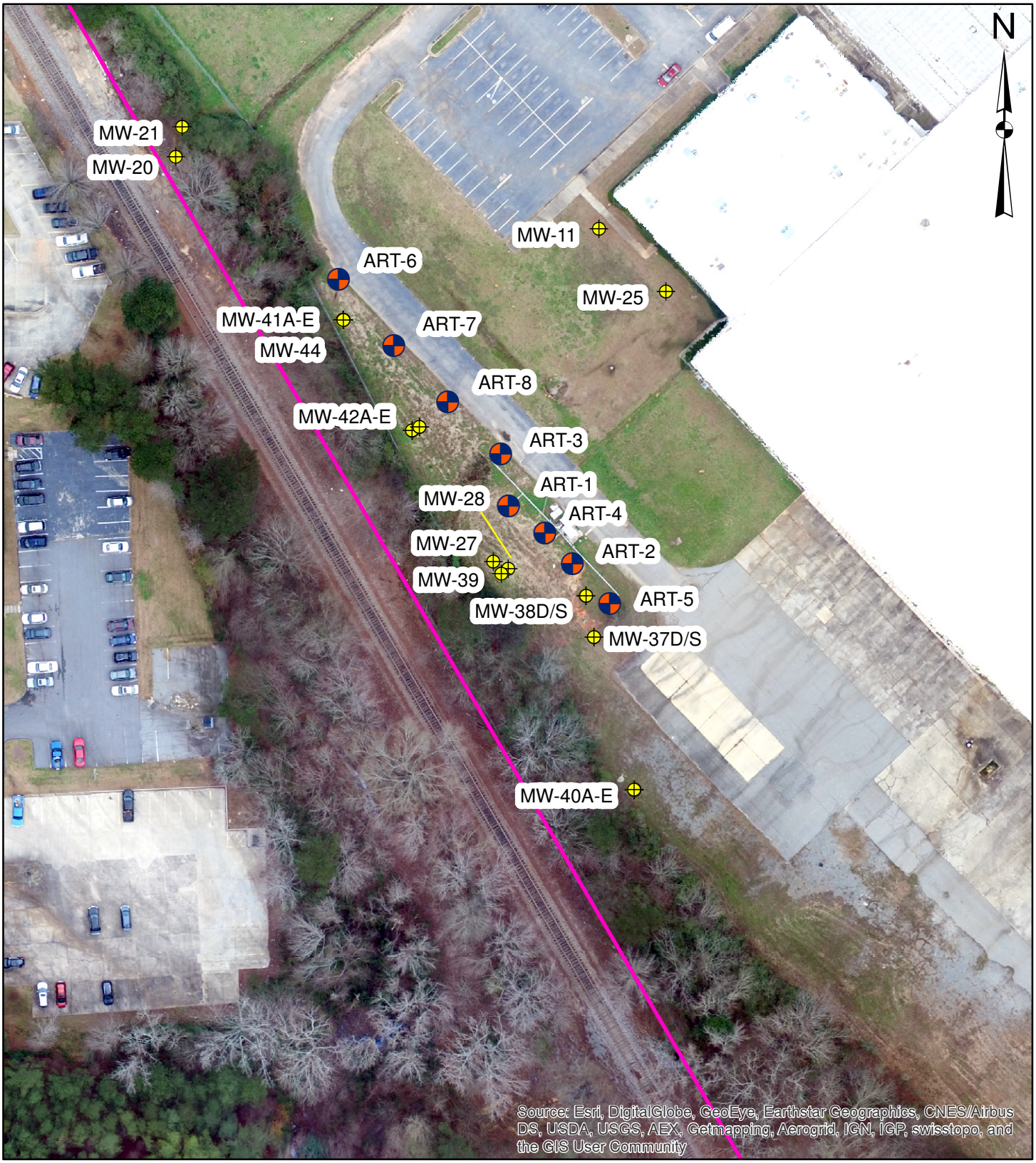
ATTACHMENT A
Field Pilot of *In Situ* Bioremediation



In Situ Treatability Study Locations

Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 1



0 40 80
Feet

Legend

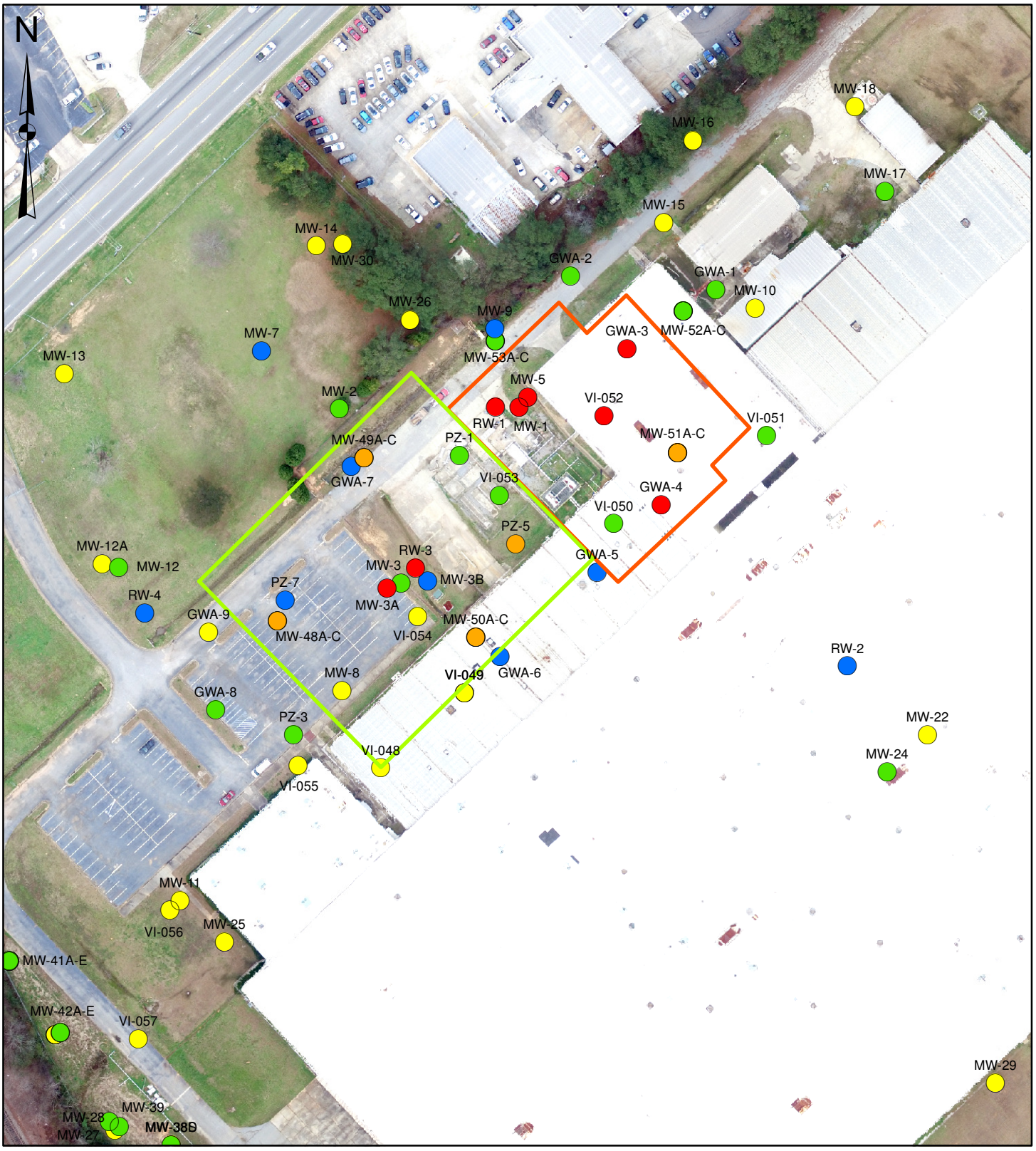
- ART Well Location
- Property Line
- Monitoring Well

Property Line Remediation Plan

Rheem Manufacturing Company
Milledgeville, Georgia

Environmental Planning Specialists, Inc.

Figure No.2



0 60 120
Feet

TCE (mg/L)

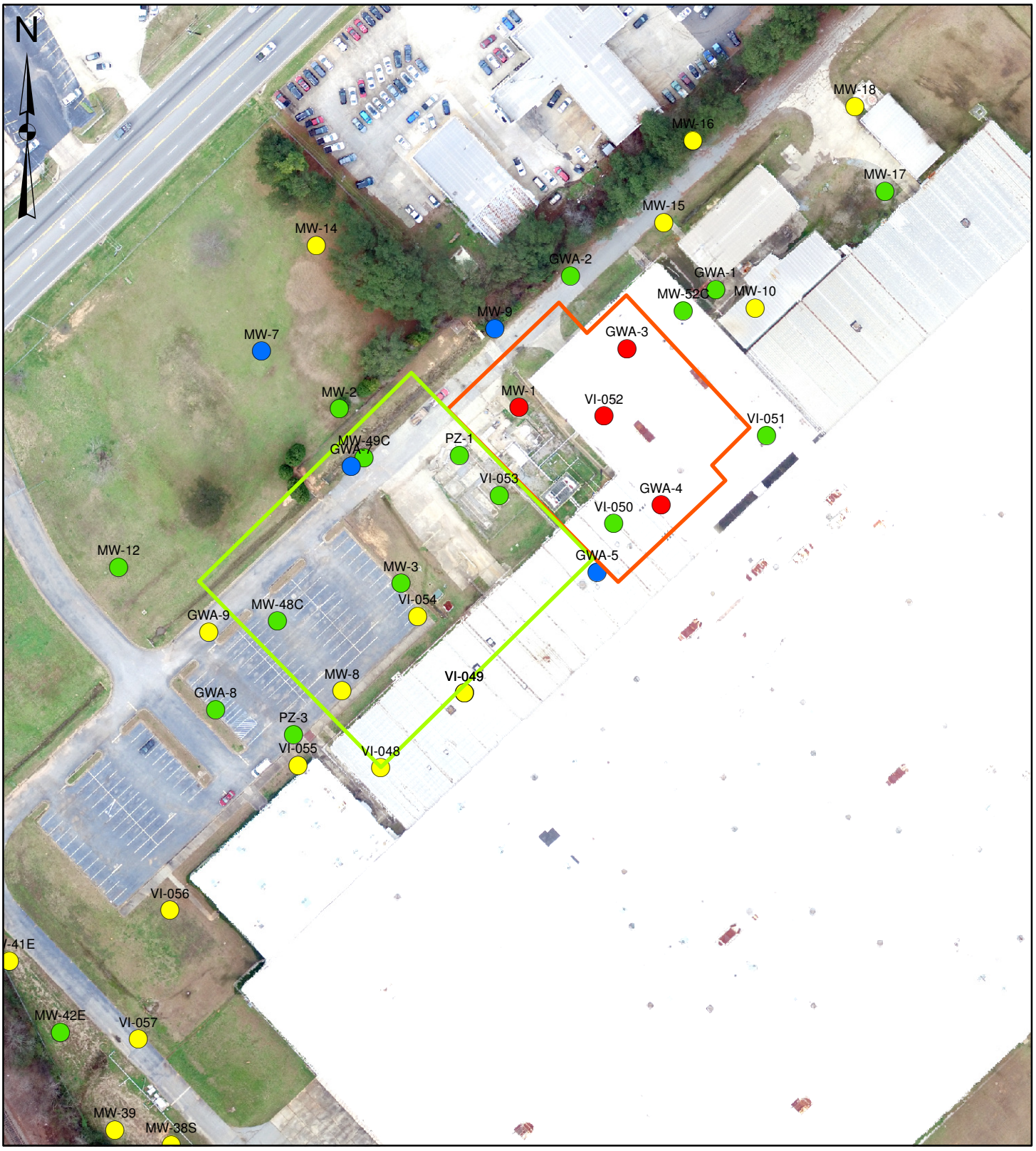
- Non-detect
- < 1
- 1 - 10
- 10 - 100
- > 100

Release Area Treatment Zones

- Release Area Zone
- Plume Zone

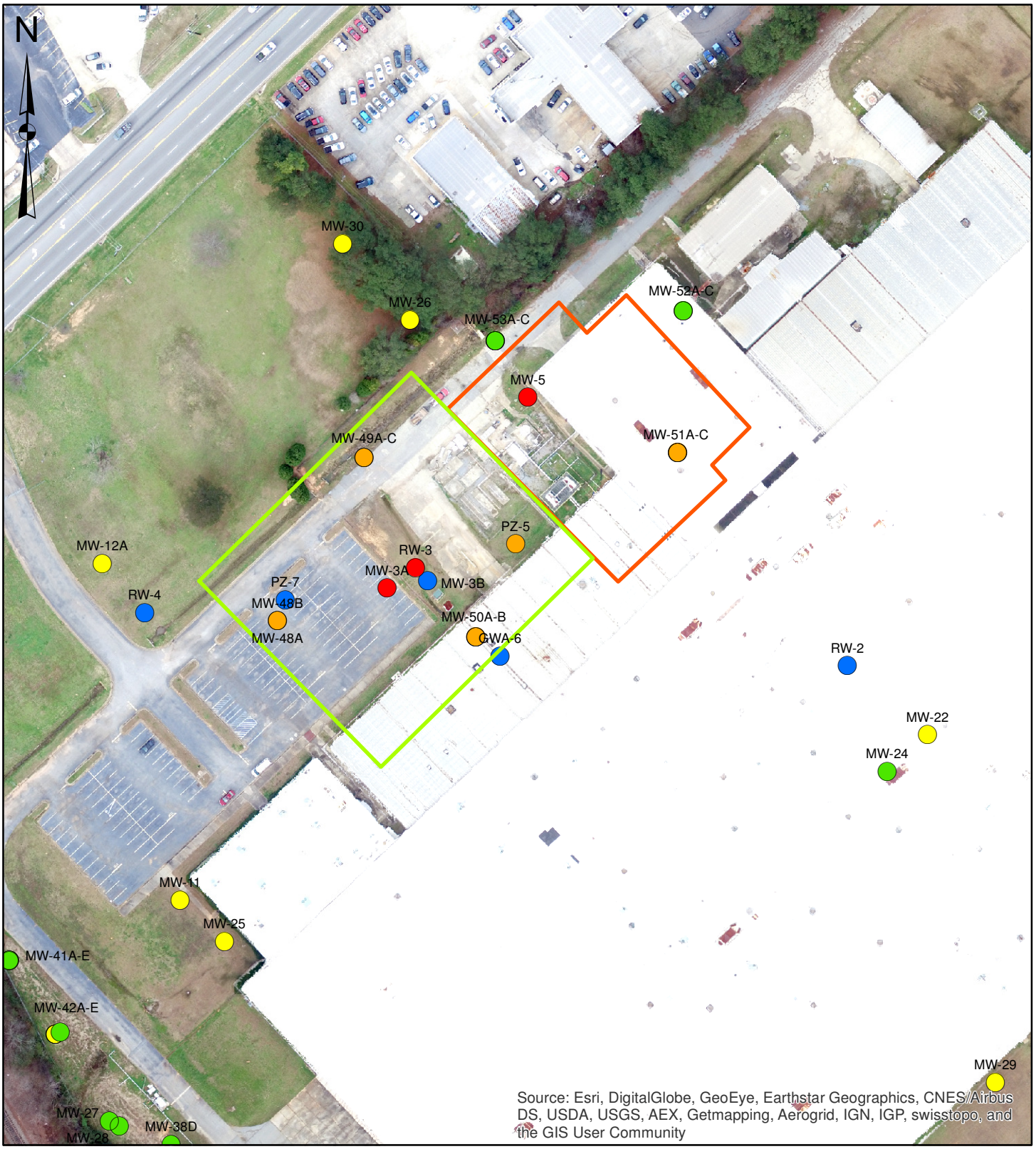
VOC Release
Area Groundwater
Remediation Treatment Zones
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 3



Shallow Groundwater TCE:
< 50 ft Deep, 2010-15
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 4



0 60 120
Feet

TCE (mg/L)

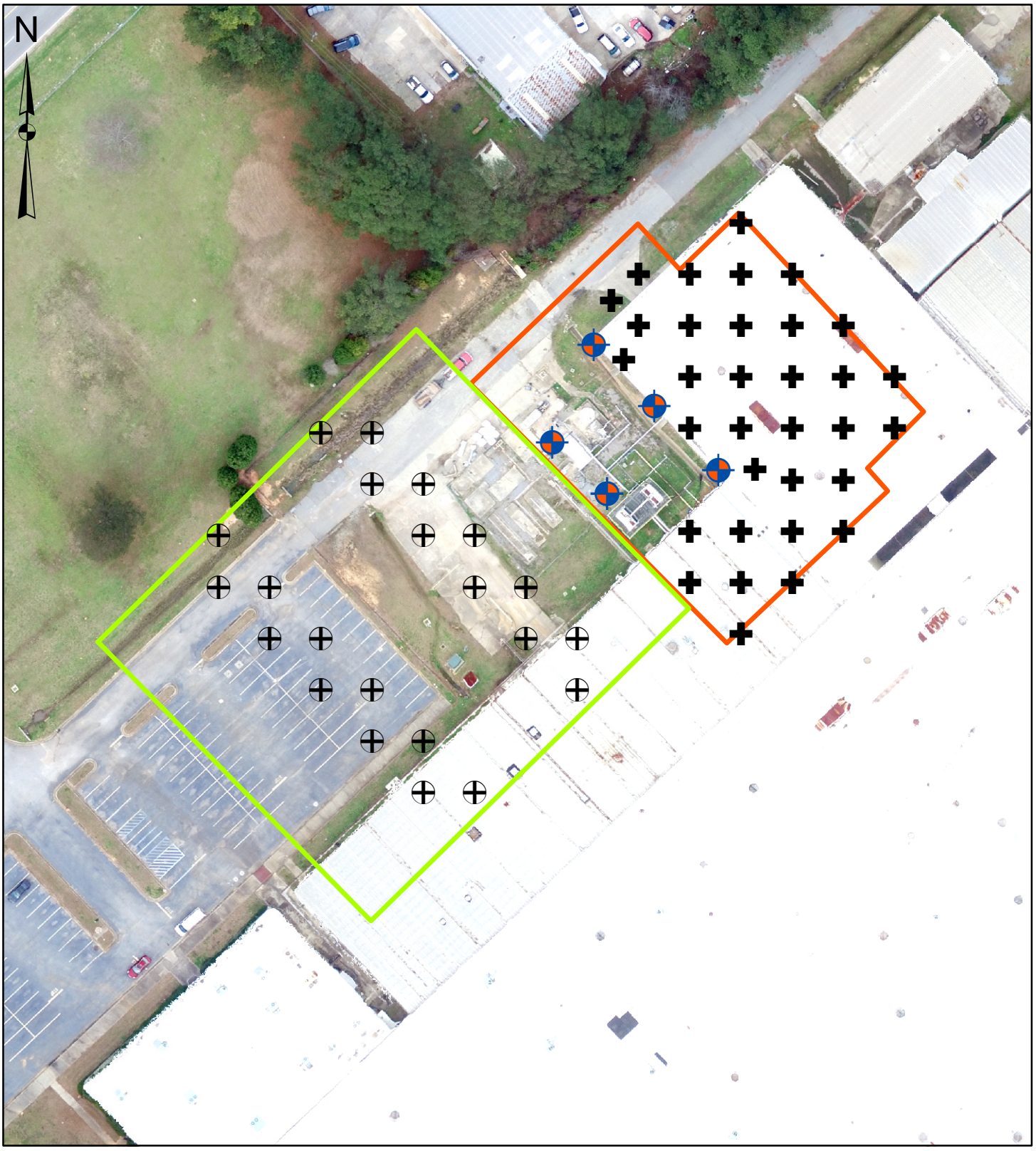
- Non-detect
- < 1
- 1 - 10
- 10 - 100
- > 100

Release Area Treatment Zones

- Release Area Zone
- Plume Zone

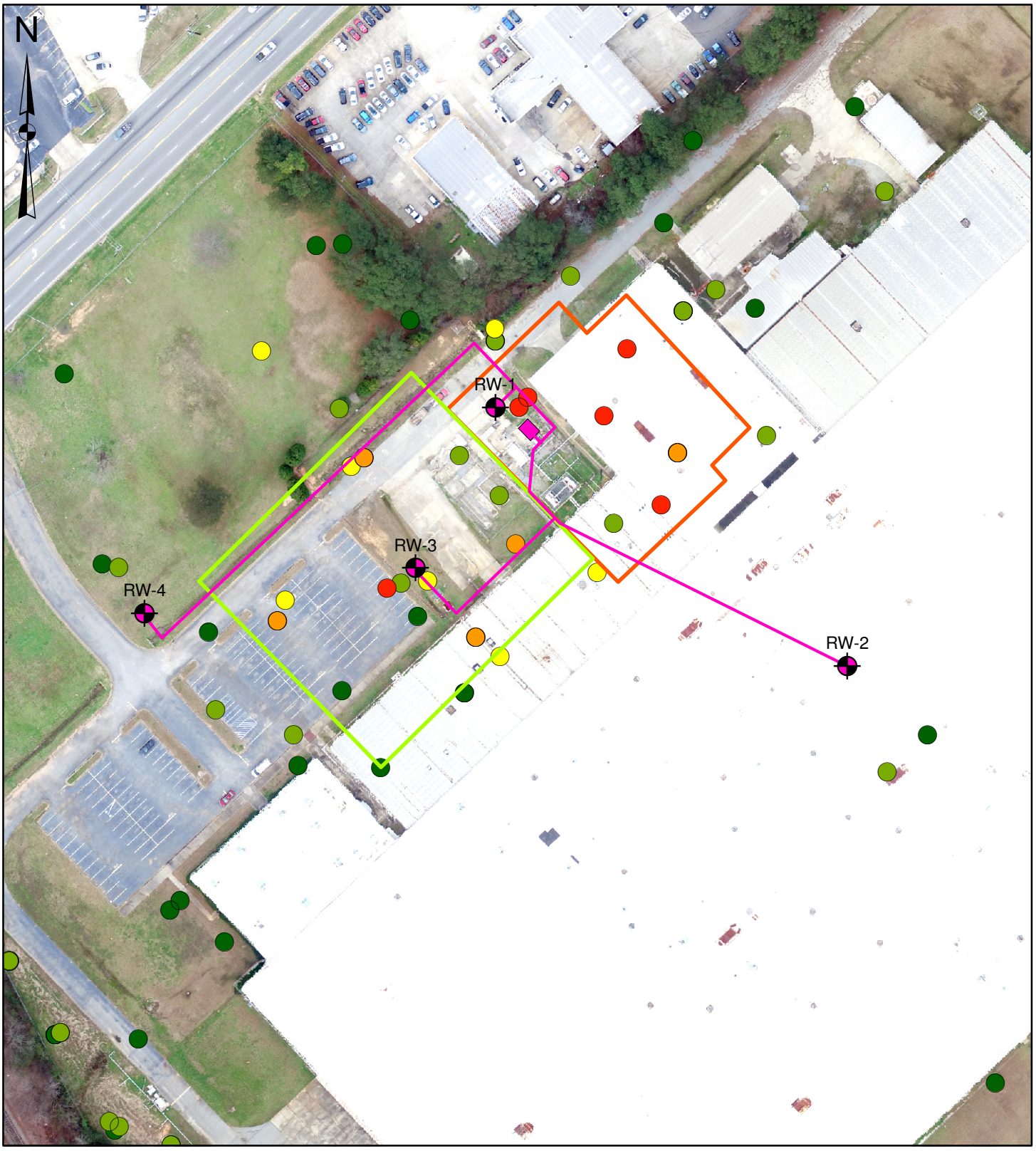
Deep Groundwater TCE:
> 50 ft Deep, 2010-15
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 5



In Situ Bioremediation Implementation Plan
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 6



Groundwater P&T System
Rheem Manufacturing Company
Milledgeville, Georgia

Figure No. 7