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2024 FOURTH QUARTER GROUNDWATER MONITORING REPORT CLAREMONT POLYCHEMICAL CORPORATION SITE

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CLAREMONT POLYCHEMICAL CORPORATION SITE

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

1. INTRODUCTION

This quarterly groundwater monitoring report, prepared by Ramboll Americas Engineering Solutions, Inc. (Ramboll), presents groundwater sampling analytical results for the fourth quarter of 2024 (October through December) and supporting information on the history, groundwater extraction and treatment (GWE&T) system configuration and hydrogeologic conditions at the Claremont Polychemical Corporation Site (NYSDEC Site #130015); hereinafter referred to as "CPC" or the "Site" (**Figure 1**).

The groundwater monitoring event was historically part of the on-going site management and long-term monitoring (LTM) activities associated with Work Assignments #28 and #43 under contract to Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR). In March 2022, the quarterly collection of ground water samples and the preparation of this deliverable were transferred to WA#24, under Ramboll's contract (D009810), and includes the following:

- Brief overview of historical Site activities;
- Discussion of the on-site GWE&T system including discharge monitoring;
- Hydrological data;
- Brief description of the field activities;
- Analytical results of monitoring well sampling, specifically those for chlorinated volatile organic compounds (VOCs) including trends and plume evaluation;
- Analytical results of the six monitoring wells installed in the downgradient investigation for VOCs, and emerging contaminants including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane; and
- Conclusions and Recommendations.

2. SITE BACKGROUND

2.1 Site History

Claremont Polychemical Corporation, a former manufacturer of pigments for plastics and inks, coated metal flakes, and vinyl stabilizers, operated at the Site from 1966 to 1980. According to the "Second Five-Year Review Report for Claremont Polychemical Corporation" prepared by the United States Environmental Protection Agency (USEPA), dated March 2014, during its operation, CPC disposed of liquid waste in three leaching basins and deposited solid wastes and treatment sludges in drums or in above ground metal tanks. The principal wastes generated were organic solvents, resins, and wash wastes (mineral spirits). A solvent recovery system (steam distillation), two pigment dust collectors and a sump were located inside the Process Building. Five concrete treatment basins, each with a capacity of 5,000 gallons which contained sediments and water, were to the west of the building. Six above ground tanks, three of which contained wastes, were located east of the building.

Other features included an underground tank farm, construction and demolition debris, drywells, and a water supply well (USEPA 2014).

In 1979, the Nassau County Department of Health (NCDH) found 2,000 to 3,000 drums of inks, resins, and organic solvents throughout the Site during a series of inspections. Inspectors identified releases associated with damaged or mishandled drums in several areas including one larger release located east of the Process Building (referred to as the"spill area"). CPC sorted and removed the drums in 1980 (USEPA 2014). In October 1980, the New York State Department of Environmental Conservation (NYSDEC) ordered CPC to commence clean-up activities at the Site. CPC did not perform the clean-up activities required by NYSDEC and CPC ceased operations at the Site in 1980 (USEPA 2014). USEPA proposed the Site for listing on the National Priorities List (NPL) in October 1984 (becauseof CPC's refusal to perform the clean-up) and CPC was subsequently listed on the NPL as a Superfund site in June 1986.

A Remedial Investigation Feasibility Study (RI/FS) was initiated in March 1988 under the oversight of the USEPA. Surface and subsurface soil, groundwater, underground storage tanks, and the Process Building were sampled as part of the RI. The RI/FS reports were released to the public in August 1990. The RI/FS findings indicated that on-site soils contaminated with tetrachloroethylene (PCE), located in the former "spill area", constituted a potential threat to groundwater resources. The spill area is adjacent to and east of the former Process Building. Other VOCs including 2-butanone, toluene, xylene, 1,2- Dichloroethane (DCE), trichloroethene (TCE), 1,1,1-trichloroethane (TCA), ethylbenzene, 1,2-dichloroethane (DCA), methylene chloride, and vinyl chloride were detected in groundwater at concentrations exceeding federal and state standards. USEPA issued two Records of Decision (RODs) signed in September 1989 and September 1990 and two Explanations of Significant Differences (ESDs) signed in September 2000 and April 2003 since completion of the RI/FS. The operable units (OUs) addressed by the RODs and ESDs are described in Table 1.

Table 1 – CPC Operable Units

Operable Unit	Description	Remedy
OU-1	Treatment and removal of wastes in 14 underground storage tanks	14 USTs and contents removed. Achieved cleanup levels allowing for unlimited use and unrestricted exposure.
OU-2	Wastes stabilized during the Sept. 1988 removal action	Testing, consolidation, treatment, and disposalof wastes in containers and basins performed. Achieved unlimited use and unrestricted exposure, later changed to commercial/light industrial because of remaining contamination below the building. 2003 ESD added additional remedial actions for OU-2 under the former Process Building including an SVE system and using the building's concrete slab as a cap for cadmium contaminated soil.
OU-3	Soil contaminated with PCE at the "spill area"	Approximately 8,800 tons of PCE contaminated soils excavated, treated, and backfilled on Site. Achieved cleanup levels allowing for unlimited use and unrestricted exposure.
OU-4	Contaminated groundwater on the CPC property	Extraction and treatment of groundwater via metals precipitation, air stripping and carbon adsorption. On-site reinjection.
OU-5	Contaminated groundwater offsite of the CPC property.	Extraction and treatment of groundwater via air stripping and off-site reinjection using the Old Bethpage Landfill treatment system extraction wells south-southeast of the CPC Site.
OU-6	Decontamination of the former Process Building	Vacuuming and dusting surfaces, asbestos abatement, pressure washing walls and interior surfaces. Achieved cleanup levels allowing for unlimited use and unrestricted exposure.

A GWE&T system was installed on-site by the USEPA and United States Army Corps of Engineers (USACE) to hydraulically contain VOCs in groundwater as the OU-4 remedy. GWE&T system operation began in February 2000, reportedly pumping and treating over 400 gallons per day (gpd). SAIC Inc. (SAIC) operated and maintained the GWE&T system, collected plant effluent samples, and performed quarterly groundwater sampling at 41 wells from 2000 to May 2011. In May 2011, the project was transferred from the USACE/USEPA to the NYSDEC. NYSDEC then contracted the same scope of work as SAIC to HRP Associates, Inc. (HRP) from May 2011 to

August 2015, HDR from September 1, 2015, through February 28, 2022 and Ramboll from March 1, 2022 to present.

USEPA issued an Explanation of Significant Differences (ESD) on September 29, 2000, that the Old Bethpage Landfill's (OBL) GWE&T was inadvertently capturing the CPC OU-5 off-site groundwater plume; therefore, the OBL GWE&T would be used to capture the off-siteplume instead of constructing a new treatment facility. At that time the Town of Oyster Bay owned and operated the OBL GWE&T (USEPA 2000).

The Town of Oyster Bay operated the OBL GWE&T under a Municipal Response Action Reimbursement Agreement for treating the contaminated groundwater associated with CPC OU-5 from January 1997 through January 2007, followed by a State Assistance Contract (SAC No. C303223) from January 2007 through 2017. The NYSDEC terminated the SAC with the Town of Oyster Bay in August 2016 in a Site Transfer Agreement that outlined the schedule, terms, and responsibilities of the transfer (NYSDEC 2016).

NYSDEC's Division of Environmental Remediation (DER) issued Work Assignment (WA# 28) to HDR for CPC OU-5, the purpose being to transfer operations, maintenance, and monitoring of the OBL/CPC OU-5 GWE&T from Town of Oyster Bay's consultant Lockwood, Kessler & Barlett, Inc. (LKB) to HDR. In October 2016, the OU-4 GWE&T was shut down, and HDR took over the operation of the OBL/OU-5 GWE&T. At that time, NYSDEC had also given the Town of Oyster Bay permission to discontinue treatment for the OBL plume which involved shutting down recovery wells RW-1 and RW-2. HDR continued operations, maintenance, and monitoring activities (collectively Site Management or SM) for CPC OU-5 consisting of former OBL GWE&T recovery wells RW-3, RW-4, and RW-5 for the period October 1, 2016 through February 28, 2018. A series of amendments (#1 through #3) were subsequently approved which allowed for HDR to continue operations and maintenance through February 28, 2022. On March 1, 2022, SM was transferred to Ramboll via WA#24, under Ramboll's contract (D009810).

In 2018 a RI downgradient from the Site was performed by HDR. This RI was conducted to further delineate the extent of off-site VOC contamination in the underlying aquifers and to evaluate the potential for contamination to reach downgradient public supply wells. The investigation involved installation of six vertical profile borings (VPBs) with push ahead groundwater sampling up to 450 ft. below ground surface (bgs), and installation and sampling of six permanent monitoring wells. The RI field activities were conducted in two phases from July 2018 through November 2018 for the installation of the first four VPBs south southeast of the CPC Site, and December 2019 through January 2020 for two VPBs to the south southwest.

All groundwater samples were analyzed for Target Compound List (TCL) VOCs by USEPA method 8260; 1,4-dioxane by USEPA Method 8270 SIM; Perfluorooctanesulfonic acid (PFOS), Perfluorooctanoic acid (PFOA), and 39 other perfluorinated compounds by USEPA Method 1633. Groundwater samples collected during the RI contained elevated concentrations of VOCs and the emerging contaminants PFOS, PFOA, and 1,4-dioxane. Refer to the Final Remedial Investigation Report Claremont Polychemical RI/FS Offsite Groundwater Plume (March 2019) for additional details. The six monitoring wells associated with the RI were added to the Claremont OU5 well program in March 2020.

2.2 Location

The CPC site is located on a 9.5-acre parcel in an industrial section of Old Bethpage, Nassau County, New York (**Figure 1**). The former 35,000 square foot Process Building, demolished in 2012, was the only building historically on the property. The concrete slab from this building remains. The 5,200 square foot GWE&T system building was constructed as part of the OU-4 remedy. The OU-4 GWE&T system was shut down on October 1, 2016 and has not been in operation since that time.

The OU-5 GWE&T system is located across the street at 150 Winding Road within the Town of Oyster Bay Solid Waste Disposal Complex (OBSWDC). The OU-5 GWE&T system includes a groundwater recovery system, water conveyance system, discharge system, monitoring wells, air stripper, and a 3,100 square foot facility for monitoring and controlling the system. The treated effluent discharges to Recharge Basin No. 1 located west of the OBL. Secondary discharge is directed to Recharge Basin No. 33 west of the Bethpage State Park Black Course for golf course irrigation in the summer (**Figure 2**). The five extraction/recovery well pump houses (RW-1, RW-2, RW-3, RW-4, and RW-5) are located on the Bethpage Black Course (**Figure 2**).

The CPC Site lies approximately 800 feet west of the border between Nassau and Suffolk Counties and is accessed via Winding Road on the property's western border. Adjacent properties include (**Figure 1**):

- South and Southeast – Bethpage State Park and golf course;
- East – State University of New York (SUNY) - Farmingdale Campus;
- West – OBSWDC and OU-5 GWE&T; and
- North – Commercial and Light Industrial.

The OBSWDC includes the closed OBL, solid waste transfer operations and the OU-5 GWE&T system currently operated by Ramboll under contract to NYSDEC. The Nassau County Fireman's Training Center (FTC), which has also contributed to soil and groundwater contamination in the area, is located approximately 500 feet south of the OBL portion of the OBSWDC. FTC had a GWE&T system that ceased operations in 2013 having achieved the cleanup objectives. The closest residences are approximately one- half mile from the Site, immediately west of the OBL. The nearest public supply well is located 3,500 feet northwest of the Site.

2.3 Site Hydrogeological Setting

The CPC site is underlain primarily by sand with interbedded, discontinuous silt and lignitic clay lenses. Upper glacial aquifer deposits that are observed are mostly absent in the area, rather the Magothy Formation is the uppermost geologic unit with a thickness of approximately 750 feet. The Raritan clay below acts as a barrier between the Magothy and Lloyd aquifers.

The "Claremont Polychemical Superfund Site Long-Term Groundwater Monitoring Old Bethpage, New York" report dated December 2001 prepared by SAIC indicated historical gradients ranging from 0.001-0.002 feet/foot and horizontal flow velocities of 0.43 feet/dayor 157 feet/year (Ebasco, 1990). Historically, groundwater contour maps produced from wells screened in both the upper glacial aquifer and the deeper Magothy aquifer depict a south-southeast flow direction across the site. The recent CPC contour maps are generally consistent with previous maps produced from the CPC monitoring well network and from investigations by others. The current

hydrogeologic conditions and groundwater contour mapping (**Figures 3, 4** and **5**) are discussed in **Section 4.1**.

3. GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

A description of the GWE&T system and a review of its contaminant recovery and hydraulic control effectiveness are provided below.

3.1 Groundwater Extraction and Treatment System Description

The OU-5 GWE&T system was originally designed to capture and treat organic contaminants associated with the contaminated groundwater plume identified because ofthe disposal of hazardous substances at the Old Bethpage Landfill site (NYSDEC Site No. 130001). The system consists of groundwater recovery through three extraction wells, water conveyance, treatment via an air stripper and discharge to recharge basins. Each of the system components are discussed below.

3.1.1 GWE&T System Extraction Wells

The groundwater collection system originally consisted of five extraction wells known as RW-1, RW-2, RW-3, RW-4, and RW-5 approximately 800 feet apart from each other in Bethpage State Park Black Golf Course south of the CPC site (**Figure 2**). The recovery wells were designed with the total maximum pumping capacity of 1.76 million gpd and a designed flow of 1.5 million gpd to the treatment system (LKB, 1993). **Table 2** provides extraction well screen intervals and total depths.

Table 2 – Extraction Well Construction Details

Well	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
RW-1*	280	185	265
RW-2*	290	230	271
RW-3	275	163	255
RW-4	270	147	250
RW-5	283	153	263

*RW-1 and RW-2 captured the OBL plume which has been remediated. Thesewells are no longer online or operated for purposes of groundwater remediation.

Recovery wells RW-1 and RW-2 were petitioned to be discontinued by the Town of Oyster Bay prior to the transition to HDR operating the OU-5 GWE&T (Town of Oyster Bay, 2016).These recovery wells historically had non-detectable or very low values for total VOCs and did not capture the CPC off-site plume. The individual VOC results were lower than their Consent Decree and Class GA standards as stated in the LKB Quarterly Remedial Action Report dated June 2016. On October 2, 2016 at the direction of the NYSDEC, RW-1 and RW-2 were taken off-line.

Prior to October 2017, the system's average influent flow rate was 628 gallons per minute (gpm), or 904,396 gpd, and the average effluent flow rate was 624 gpm, or 899,233 gpd. In October 2017, pump failures stemming from a possible power surge resulted insubstantial system downtime and, thus, decreased average flow rates for influent (539 gpm, or 775,450 gpd) and

effluent (532 gpm, or 765,700 gpd). The suspected power surge also caused process control issues that precluded automatic operation of the system. As such, the system was run manually and only during working hours from November 2017 through July 2018. The restricted operation of the system in manual mode, along with the process alarms and interlock gauges not functioning required oversight of the facility while online. In early July, NYSDEC instructed HDR to add a second shift operator to accommodate NYS Parks, Recreation and Historic Preservation (Parks) request for additional irrigation water for the golf course. Recovery wells RW-1 and RW-2 were brought on-line to increase the water level in Recharge Basin 33 from which Parks obtain sits irrigation water. On September 6, 2018, the control system was fully functional, and RW-1 and RW-2 were taken off-line.

In September 2018, the process control system, controls, and alarm system became fully functional which allowed the treatment system to operate without onsite staff supervision. The recovery wells currently run-in automatic mode with remote start up, and the process pumps are operated in fully automatic mode.

Under current conditions, the PLC and the control system are stable and fully functional. Flows from the individual recovery wells are remotely read, transmitted, and totalized.

Refer to the Monthly O&M reports for October through December 2024 for details on the status of GWE&T system upgrades, issues encountered, and impacts on system operations and performance. Average daily system flow rates during the fourth quarter of 2024 were 750 gpm in October, 654 gpm in November, and 722 gpm in December.

3.1.2 GWE&T System - Path of Remediation

Groundwater is currently pumped from three extraction wells (designated RW-3, RW-4, and RW-5) that were installed in 1992 at what was then the leading edge of the off-site VOC plume from the OBL. The combined flow from the extraction wells is directed through common conveyance piping to the air stripper wet-well. A triplex pump arrangement delivers the collected groundwater into the top of the air stripper, which contains packing media. As the groundwater passes through and saturates the packing, it contacts air that is directed from the bottom of the air stripper via the blower. Dissolved VOCs pass from the liquid phase (groundwater) into the gas phase (air) and exit the stripper through an exhaust stack. Non-volatile organic compounds and inorganic contaminants, if any, are not removed by the treatment system.

A GAC treatability study was conducted between April 26, 2024 through September 17, 2024 in an effort to evaluate treatment of PFAS in extracted groundwater. A temporary GAC treatment system was installed on the effluent end of the air stripper prior to effluent being directed into a receiving wet-well. Results associated with the GAC treatability study will be detailed under separate cover in a forthcoming Treatability Study Report.

Air stripper effluent directed into the receiving wet-well is then delivered to two recharge basins. Recharge Basin No. 1 contains a system of eight diffusion wells and is located upgradient of the OBL. Recharge Basin No. 33 receives effluent in the summer that is used beneficially for watering the golf course.

The GWE&T system is staffed by a plant manager/operator working 40-hour weeks, and an autodialer (telemetry unit) is installed to contact the plant manager in case of plant alarms. Typical response time to any alarms is 30 minutes. The plant manager can monitor the plant remotely from the FactoryTalk View Site Edition Client control system and adjust the system operations as needed.

3.1.3 GWE&T System Operating Permits

Water Permit

The OU-5 GWE&T operates under a State Pollutant Discharge Elimination System(SPDES) permit equivalency dated October 24, 2012 which was valid until May 11, 2016. A permit equivalency renewal application was submitted to the NYSDEC Bureau of Water Permits on March 30, 2016 and is pending approval. Effluent Limitations and Monitoring Requirements outlined in the permit are enforced by the NYSDEC Division of Environmental Remediation, Remedial Bureau E.

Air Permit

An air permit is not required for the GWE&T system operation since 6 NYCRR Part 375-1.7 states that "no permit is required when the substantive compliance is achieved as indicated by the NYSDEC approval of the workplan." Emissions from the air stripper have historically been negligible and are compliant with air guideline concentrations.

3.2 Groundwater Extraction and Treatment System Performance Evaluation

3.2.1 Flow Rate

Since startup, the OU-4 GWE&T system treated more than approximately 2.97 billion gallons of groundwater associated with the CPC site until operation was suspended and transitioned to the OU-5 plant. The OU-5 GWE&T system historically operated at a rate ofapproximately one million gpd. Daily flow readings are provided in the O&M reports submitted monthly to NYSDEC (refer to the September 2024 O&M report for the most recent data). A summary of the flow in each recovery well is included in the table below.

Table 3 – Recovery Well Monthly Flow Summary for this Quarter

Location	October Total Flow (gallons)	November Total Flow (gallons)	December Total Flow (gallons)
RW-1*	0	0	0
RW-2*	1,045	1,045	0
RW-3	9,677,000	6,041,000	10,163,000
RW-4	10,164,000	11,663,000	10,720,000
RW-5	9,434,000	10,769,000	9,897,000
Total Influent	30,241,000	29,475,000	31,549,000
Total Effluent	29,442,000	29,183,000	30,165,000

Location	October Total Flow (gallons)	November Total Flow (gallons)	December Total Flow (gallons)
*Recovery wells RW-1 and RW-2 were taken offline at the conclusion of the Remedial System Optimization evaluation. Flows associated with RW-1 and RW-2 are from monthly operational tests.			

The volume of treated water discharged by the GWE&T system to the recharge basins is determined daily from readings of the magnetic flow meter on the plant effluent line. The difference between the total influent and total effluent is due to a calibration error in the existing flow meters. The recharge basins are designed to receive 1.5 million gpd of effluent.

During the fourth quarter of 2024, the system processed approximately 88,790,000 million gallons with the following average daily flow rates:

Table 4 – Average Daily Flow by Month for this Quarter Summary

Month (2024)	Average Daily Flow (gallons per day)
October	975,516
November	950,806
December	1,087,897
Quarterly Average	977,100

3.2.2 Groundwater Extraction and Treatment System Contaminant Removal

To quantify the treatment system contaminant removal rate, available GWE&T system influent and effluent analytical results from monthly operation and maintenance records were reviewed. The OU-4 GWE&T system removed 947 kg cumulatively (combined mass of TCE, PCE and 1,1-DCE) from 2002 until October 2016, when it was taken offline. Most of the mass removed by the OU-4 GWE&T system was TCE (749 kilograms or 1,651 pounds) and PCE (170 kilograms or 375 pounds).

Since October 1, 2016, approximately 692.14 kilograms (1,525.90 pounds) of TCE, 89.21 kilograms (196.68 pounds)of PCE, and 13.62 kilograms (30.03 pounds) of 1,1-DCE have been removed by the OU-5 system (as of the 2024 fourth quarter process sampling event which was performed in December 2024).

The previous OU-5 operator (prior to October 1, 2016) did not calculate VOC load or track the contaminants of concern cumulatively over time. The LKB reports did not include historical data for daily flow rates.

Table 5 – VOC Mass Removed per Quarter for 2019 through 2024 (kg)

Year	Quarter	OU-4 GWE&T	OU-5 GWE&T
Pre 2019	-	947*	215.35
2019	Q1	Offline	38.75
	Q2	Offline	32.54
	Q3	Offline	36.95
	Q4	Offline	49.64
2020	Q1	Offline	8.35
	Q2	Offline	30.72
	Q3	Offline	37.09
	Q4	Offline	36.25
2021	Q1	Offline	34.11
	Q2	Offline	35.51
	Q3	Offline	25.43
	Q4	Offline	30.21
2022	Q1	Offline	27.29
	Q2	Offline	36.39
	Q3	Offline	3.71
	Q4	Offline	4.04
2023	Q1	Offline	5.75
	Q2	Offline	6.94
	Q3	Offline	12.58
	Q4	Offline	13.30
2024	Q1	Offline	28.54
	Q2	Offline	10.93
	Q3	Offline	12.78
	Q4	Offline	21.42
	Cumulative Total	947*	794.57

*Cumulative totals presented for OU-4 are from 2002 through 2016.

**Cumulative totals presented for OU-5 are from October 1st, 2016 to present and include TCE, PCE, and 1,1-DCE.

3.2.3 Groundwater Extraction and Treatment System Discharge Monitoring

Effluent samples are collected and analyzed quarterly for: VOCs, base neutral acid (BNA) semi-volatile list, metals, total dissolved solids (TDS), total Kjehldahl nitrogen (TKN), cyanide, and anions. Effluent data for select VOC compounds (PCE, TCE, and 1,1-DCE) and semi-volatiles (BNA) are analyzed to evaluate compliance with effluent discharge limits. **Figure 6** shows that effluent concentrations for the main contaminants, PCE and TCE, were below permissible discharge limits of 5 µg/L at the OU-5 GWE&T system during the fourth quarter of 2024. In addition, the effluent concentrations of detected parameters, were under permissible levels: barium (80 µg/L), manganese (150 µg/L), total nitrogen (9.5 mg/L), and total dissolved solids (260 mg/L) during the third quarter of 2024 when sampled in September. The addition of emerging contaminant sampling to system monitoring is detailed in the following section. All other constituents monitored for discharge requirements met their respective discharge

limitations, as indicated in the monthly O&M reports relevant to this quarter, or do not have a corresponding discharge limitation.

System effluent pH remained within the required limitations (6.5 to 8.5 su) for this quarter with the following average monthly readings:

Table 6 – Average Monthly Discharge pH

	October	November	December
Average Effluent pH (su)	7.06	7.01	7.09

Refer to the Monthly O&M reports for additional information on remediation system performance and daily operations.

3.3 Plant Process Water Emerging Contaminant Sampling

On December 15, 2020, plant influent, effluent, and active recovery wells (RW-3, RW-4, and RW-5) were sampled for 1,4-dioxane by method 8270 SIM and PFAS by modified USEPA Method 537. Samples were submitted to Eurofins TestAmerica, of Edison, New Jersey, an NYSDOH ELAP-approvedlaboratory (#12028).

Samples were collected from sample ports off the pump discharges at each recovery well and the plant's influent and effluent conveyance, after flushing the port and valve with several gallons of water. Process water was collected directly into the laboratory supplied glassware.

Five samples were collected from the plant's influent, effluent, and active recovery wells. Recovery well locations are shown on **Figure 2**.

1,4-dioxane was detected in all five samples and at concentrations exceeding the standard of 1 µg/L.

PFOS was detected at concentrations exceeding its criteria in four of the five samples except in the sample from RW-4 which was detected below the criteria. PFOA was detected in all five samples. Numerous other PFAS compounds were detected but did not exceed their individual criteria. The sum of PFAS compounds did not exceed criteria. Full results for the emerging contaminant sampling of plant process water are presented in Attachment A2 of the 2020 Fourth Quarter Groundwater Monitoring Report (HDR, 2020).

At the direction of the NYSDEC in an August 17, 2022 email, analysis of PFAS and 1,4-dioxane were added to monthly sampling for both influent and effluent for the foreseeable future.

Samples were collected from sample ports at the plant's influent and effluent conveyance, after flushing the port and valve with several gallons of water, directly into the laboratory supplied glassware. Samples were analyzed by Pace Analytical, of East Longmeadow, MA, an NYSDOH-ELAP approved laboratory. 1,4-Dioxane samples were analyzed utilizing USEPA Method 8270 SIM. PFAS samples were analyzed utilizing USEPA Method 1633, in accordance with the *NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoralkyl Substances (PFAS) Under NYSDEC's Part 375 Remediation Programs* (April 2023).

Detected concentrations for compounds that exceeded their respective evaluation criteria or standards for the fourth quarter of 2024 are shown in the summary table below. **Figure 7** depicts 1,4-dioxane results exceeding comparison criteria. **Figure 8** depicts the PFOS and PFOA results exceeding comparison criteria.

NOTE: Criteria presented in the following table represent current standards, guidance values, or other evaluation criteria.

Table 7– 4Q2024 Process Water EC Exceedances

EC Exceedances		1,4-D	PFOS	PFOA
Criteria:		0.35[(a)]	2.7[(a)]	6.7[(a)]
Reporting Unit:		(µg/L)	(ng/L)	
Influent	**October 2024**	**16**	**16**	**37**
	November 2024	**14**	**16**	**47**
	December 2024	**19**	**15**	**49**
Effluent (PD-009)	**October 2024**	**15**	**16**	**36**
	November 2024	**15**	**15**	**45**
	December 2024	**19**	**15**	**46**

Bold and underlined results indicate exceedance of the criteria indicated as follows:

a) For 1,4-dioxane and PFAS compounds: NYSDEC's Division of Water Technical, and Operational Guidance Series (TOGS) (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations dated June 1998 and last updated in February 2023.

Abbreviations: 1,4-D – 1,4-Dioxane; PFOS – Perfluorooctanesulfonic acid; PFOA – Perfluorooctanoic acid; NS – not sampled; ND – not detected; J – estimated value; µg/L – micrograms per liter, ng/L – nanograms per liter.

4. GROUNDWATER MONITORING PROGRAM

A network of 55 monitoring wells is used to monitor groundwater quality and effectivenessof the GWE&T system (**Figure 2**). The groundwater monitoring program includes wells on the CPC property (OU-4) and off the CPC property (OU-5).

OU-4 monitoring wells included in the network are:

- DW-1, DW-2, EW-5, SW-1 and WT-01.

OU-5 monitoring wells included in the network are:

- BP-3A, BP-3B, BP-3C, EW-1A, EW-1B, EW-1C, EW-2A, EW-2B, EW-2C, EW-2D,EW-4A, EW-4B, EW-4C, EW-4D, EW-7C, EW-7D, EW-11D, EW-12D, EW-14D, LF-1, M-30B-R, MW-5B, MW-6A,

MW-6B, MW-6C, MW-6D, MW-6E, MW-6F, MW-7B-R, MW-8A, MW-8B, MW-8C, MW-9B, MW-9C, MW-10D, MW-11A, MW-11B, and OBS-1.

Following approval from the NYSDEC on August 21, 2019, an additional six wells from the western extent of the study area were added to the program. These wells are:

- BP-5B, BP-5C, BP-12B, BP-12C, BP-13B, and BP-13C.

In February 2020, an additional six downgradient monitoring wells were added to the quarterly monitoring:

- MW-CPC-36, MW-CPC-37, MW-CPC-38, MW-CPC-39, MW-CPC-40, and MW-CPC-41.

A description of the groundwater sampling event and results is provided below.

4.1 Hydrologic Data

The network of approximately 120 gauged wells includes wells that are not in the quarterly sampling program. Measurements from 66 wells collected by Ramboll are combined with data provided by Nassau County. Measurements collected by Ramboll are provided in **Attachment A** and groundwater contours are provided in **Figures 3, 4,** and **5**. The synoptic groundwater level measurement for this quarter was performed on July 30. It should be noted that wells BP-6A, BP-11, EW-6A, EW-6C, MW-6A, ORW-1, U-6A, and UM-1 were not accessible during this synoptic round. Additionally, due to time constraints during gauging, wells ORW-2, ORW-4, ORW-5A, ORW-6, and ORW-7 were not measured.

The average water table elevation across the OU-5 site for this quarter's synoptic measurement event was 62.66 feet (vertical datum NAVD88) as measured by Ramboll. Depths to groundwater (DTW) in July 2024 ranged from 17.90 feet (well MW-CPC-41) to 99.77 feet (well EW-11D) below ground surface (bgs) (see **Attachment A**). Potentiometric surface elevations at each well were calculated for each well by subtracting the DTW from the top of casing elevation. Groundwater elevations, grouping wells by the aquifer unit they are screened in, were used to develop and interpret potentiometric contours of the in the upper (water table), middle, and lower Magothy aquifers.

Groundwater flow direction is predominantly south-southeast at the water table (**Figure 3**), middle Magothy (**Figure 4**), and in the lower Magothy (**Figure 5**). The potentiometric surface contours in the middle Magothy depict minor pumping influence near and immediately down gradient from the OU5 recovery wells, RW-2 through RW-4. In the vicinity of BP-13, MW-CPC-40, and MW-CPC-41 within the lower Magothy aquifer there is a south-southwest component to groundwater flow. Overall, groundwater elevations and the inferred groundwater flow directions are consistent with previous quarterly observations.

4.2 Groundwater Sample Collection

The monitoring well groundwater samples were collected for this quarter between October 2 and October 9, 2024. Ramboll and GES sampled 54 of the 55 CPC monitoring network wells. No sample was collected at MW-6A due to insufficient water.

Forty-nine groundwater samples were collected using passive diffusion bags (PDBs) inserted at mid-point in the screens in each monitoring well. Each PDB bag was retrieved, pierced with a decontaminated sharp object and the water inside was collected in VOC vials with septum caps, and preserved with hydrochloric acid (HCl). The VOC vials are labeled, recorded on a chain of custody, and placed in a cooler with ice.

Groundwater samples from the downgradient six MW-CPC series wells (MW-CPC-##) were collected using the low-flow sampling method "USEPA Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from monitoring Wells" dated January 19, 2010. The intake of the Geo-Tech PFC free portable bladder pump was installed at the mid-point of the screened zone or biased to a depth where a higher VOC concentration was observed during the VPB sampling. Monitoring wells were purged until low-flow parameters (turbidity, dissolved oxygen, specific conductivity, temperature, pH, and oxidation/reduction potential) stabilized in accordance with USEPA's low-flow method protocols. A list of sampled wells and analytical results are presented in **Table 8** and **Attachments B** and **B1** at the end of this report (see **Attachment C** for full lab deliverable). Low-flow sampling logs, chains of custody (COC), and PFC daily checklists are provided in **Attachment D**.

A total of 60 samples (including three field duplicates, two trip blanks, and one equipment blank) were collected and submitted to Pace Analytical, of East Longmeadow, MA, an NYSDOH-ELAP approved laboratory. With exception to the equipment blank, each sample was analyzed for VOCs via USEPA Method 8260. Of the aforementioned samples, eight samples (including one field duplicate and one equipment blank [PFAS only]), collected from the MW-CPC wells, were also analyzed for PFAS by modified USEPA Method 1633 and 1,4-dioxane by method 8270 SIM.

4.3 Groundwater Analytical Results

4.3.1 Groundwater VOC Analytical Results

First quarter 2024 groundwater sampling event VOC exceedances are summarized in **Table 8** and are plotted in trend charts provided as **Figures 9** through **31**; treatment system effluent and influent water sampling results are shown in trend charts on **Figures 9** and **31**, respectively. The six downgradient MW-CPC monitoring well VOC exceedances are summarized on **Figure 32**. Water classification GA standards and guidance values obtained from Table 1 of NYSDEC's *Division of Water Technical, and Operational Guidance Series (TOGS) (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* dated June 1998 and subsequent addenda were used to evaluate VOC results. TOGS 1.1.1 incorporates 6 NYCRR Part 703.5 Class GA groundwater criteria and supplements with additional guidance values.

In addition to the results below, acetone was detected above the NYSDEC TOGS 1.1.1. guidance value of 50 µg/L in 44 field samples (including the field duplicates) collected from PDBs, as provided in **Attachment B**. Acetone was not detected in downgradient MW-CPC monitoring wells.

Table 8 – Monitoring Well VOC Exceedances (in µg/L)

	PCE	TCE	cis-1,2-DCE	VC	1,2-DCA	1,1-DCA	Benzene
Criteria:	5	5	5	2	0.6	5	1
BP-3C	**8.2**	< 1 U	3.2	< 2 U	< 1 U	< 1 U	< 1 U
EW-11D	**47 D**	**170 D**	**4.6 D**	< 4 U	< 2 U	3.5 D	< 2 U
EW-12D	**19 D**	**370 D**	**6.0 D**	< 8 U	< 4 U	< 4 U	< 4 U
EW-14D	< 1 U	**15**	< 1 U	< 2 U	< 1 U	< 1 U	< 1 U
EW-4A	**17**	1.9	**22**	< 2 U	< 1 U	< 1 U	< 1 U
EW-4C	1.9	**19**	< 1 U	< 2 U	< 1 U	< 1 U	< 1 U
EW-7C	**16 D**	**260 D**	3.1 D	< 4 U	< 1 U	< 2 U	< 2 U
MW-10D	**14**	**200**	**6.1**	< 2 U	< 1 U	**1.5**	< 1 U
MW-11A	**5.6**	**6.0**	**54**	< 2 U	< 1 U	**7.1**	< 1 U
MW-11B	4.4	**6.3**	**45**	**2.5**	**1.2**	**21**	**1.3**
MW-7B-R	1.9	**100**	2.4	< 2 U	< 1 U	< 1 U	< 1 U
MW-CPC-36	**54**	**7.9**	**50**	< 2 U	< 1 U	1.0	**39**
MW-CPC-37	< 1 U	< 1 U	**6.8**	< 2 U	< 1 U	2.1	< 1 U
MW-CPC-40	< 1 U	2.1	< 1 U	< 2 U	< 1 U	**5.3**	< 1 U
MW-CPC-41	**5.4**	< 1 U	< 1 U	< 2 U	< 1 U	< 1 U	< 1 U
SW-1	**360 D**	**25 D**	**17 D**	< 8 U	< 2 U	< 4 U	< 4 U

Result values presented in µg/L. ND – not detected above the reporting limit; J – estimated value; D – diluted. Bold, underlined results are exceedances of the NYSDEC Part 703 Class GA criteria, which is incorporated into the TOGS 1.1.1 (June 1998 and subsequent addenda). See **Attachment B** for complete analytical results and comparison criteria. Abbreviations: PCE – tetrachloroethylene; TCE – trichloroethylene; cis-1,2-DCE – cis-1,2- dichloroethylene; VC – vinyl chloride, 1,2-DCA – 1,2-dichloroethane, 1,1-DCA – 1,1-dichloroethane; 1,4-DCB – 1,4-dichlorobenzene.

4.3.2 Groundwater Emerging Contaminant Results

In the fourth quarter 2024, the six downgradient MW-CPC series monitoring wells (**Figure 2**) were analyzed for the emerging contaminants 1,4-dioxane and the PFAS group of contaminants.

The criteria used to evaluate 1,4-dioxane, PFOS, and PFOA is the NYSDEC 2023 Addendum to NYSDEC's *Division of Water Technical, and Operational Guidance Series (TOGS) (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* dated June 1998 Maximum Allowable Concentration of 0.35 µg/L, 2.7 ng/L, and 6.7 ng/L, respectively.

Detected concentrations of compounds exceeding their respective criteria as listed above are shown on **Figures 33** and **34**, **Attachment B1**, and summarized in the table below.

Table 9 – Monitoring Well Emerging Contaminant Exceedances

	1,4-D	PFOS	PFOA
Criteria:	0.35 (a)	2.7 (a)	6.7 (a)
Reporting Unit:	(µg/L)	(ng/L)	
MW-CPC-36	**6.1**	**170**	**160**

	1,4-D	PFOS	PFOA
MW-CPC-37	**19**	**28**	**64**
MW-CPC-38	**0.74**	<0.99 U	<0.99 U
MW-CPC-40	**2.3**	<0.93 U	<0.93 U
MW-CPC-41	**2.2**	**29**	**25**

No detected concentrations of the compounds presented above exceeded their respective criteria in the samples from MW-CPC-39. Bold and underlined results indicate exceedance of the criteria indicated as follows:

a) For 1,4-dioxane and PFAS compounds: NYSDEC's Division of Water Technical, and Operational Guidance Series (TOGS) (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations dated June 1998 and last updated in February 2023.

Abbreviations: 1,4-D – 1,4-Dioxane; PFOS – Perfluorooctanesulfonic acid; PFOA – Perfluorooctanoic acid; ND – not detected; J – estimated value. B – analyte found in associated blank as well as in the sample µg/L – micrograms per liter, ng/L – nanograms per liter.

4.3.3 Evaluation of Plumes

Figures 35 and **36** depict the horizontal plume location with approximated isoconcentration lines for PCE and TCE in plan view. The groundwater contamination distribution was further evaluated by creating sample location pie charts depicting the relative contributions of the chlorinated VOC contaminants PCE, TCE, 1,1-dichloroethene, trans-1,2- dichloroethene, cis-1,2-dichloroethylene, and vinyl chloride to their sum in cross section (**Figures 37** and **38**) and plan view (**Figure 39**). The horizontal and vertical distribution of PCE and TCE continues to demonstrate a shallow PCE plume comingled with a deeper TCE plume.

OU-4 on-site plume. This plume originates on the CPC site with the highest PCE concentrations historically measured at well SW-1, a water table well. Currently, the on-site plume is predominantly PCE with concentrations an order of magnitude greater than those of TCE. In 2015, PCE showed an increasing trend in well SW-1, with spikes in the second quarter (210 µg/L) and in the fourth (190 µg/L) of that year. However, in 2016 the PCE concentration steadily decreased from 150 µg/L during the first quarter down to 30 µg/L in the fourth. SW-1 was not sampled between the fourth quarter of 2016 and the second quarter of 2019, due to it becoming dry and subsequent low water levels. The PDB in SW-1, which was in the well since the fourth quarter of 2016, was submerged in the first and second quarter of 2019, due to an increase in the water table elevation. It was subsequently sampled in the second quarter of 2019 and had the highest concentration of PCE (180 µg/L) out of all on-site wells. The PCE concentration in SW-1 has generally increased since 2019. However, PCE concentrations have decreased throughout 2022 into 2023 with a high of 500 µg/L observed in the first quarter 2022 and a low of 86 µg/L observed in the second quarter of 2023. PCE concentrations at SW-1 have generally increased from the third quarter of 2023 through 2024. While remaining an order of magnitude lower than PCE, TCE has consistently mirrored these quarterly PCE variations (**Figure 10**).

Off-site plume upgradient of CPC site. This plume contains VOCs from upgradient sources such as Former Aluminum Louvre (FAL). The plume can be detected as far upgradient as the EW-7-series well cluster and stretches southeast into OU5 as far as well MW-7B-R. The FAL (OU-1) and off-

site (OU-2) investigations were completed in 2015, with the most recent Record of Decision (ROD) for OU-2 issued in March 2019. Groundwater containing VOCs, primarily TCE, migrated from FAL to beneath the Bethpage State Park Black Golf Course. The source area at FAL is at the east side of the facility and a large storm water recharge basin at Winding Road and Old Bethpage-Sweethollow Road is thought to influence shallow groundwater flow direction beneath FAL in an easterly direction. The FAL plume contains TCE, PCE, and 1,1,1-TCA and flows south-southeast after it moves off-site. When it reaches the CPC site, the FAL plume is found to the east of the CPC source areas.

The plume is predominantly TCE, with TCE concentrations typically an order of magnitude greater than those of PCE in EW-7C (**Figure 17**). TCE-dominant wells include EW-4B, EW-4C, EW-7C, EW-11D, EW-12D, EW-14D, MW-7B-R, and MW-10D. MW-7B-R TCE concentrations have been trending downward since the OU-4 plant was shut down (**Figure 27**). Despite an overall upward trend of TCE concentrations in EW-12D, TCE has been relatively stable since the plant shutdown (**Figure 20**). While an overall slightly decreasing trend has been observed at EW-7C, a slight upward trend was observed from the end of 2019 through the fourth quarter in 2022 and again from second quarter through first quarter 2024 (**Figure 17**).

Well EW-14D. Groundwater contamination at EW-14D is typically TCE dominant, similar to the off-site, upgradient plume. The PCE concentration is typically below the groundwater quality standard of 5 µg/L (see **Figure 21**). Well EW-14D has the greatest variability in TCE concentrations. However, the overall TCE trend is decreasing.

Southern Area. This location is centered on the BP-3 series wells (BP-3A, B, and C) south of the CPC site and downgradient of the extraction wells (**Figures 22** through **24**). The PCE concentrations at BP-3B and BP-3C are historically higher than those of TCE. Both BP-3B and BP-3C also have exceedances above standard for cis-1,2-DCE. Trends for PCE, TCE, and cis-1,2-DCE at BP-3B and BP-3C are decreasing.

Cross Sections. Two cross section figures depict the contaminants of concern along two transects (**Figures 37** and **38**). Cross section A-A' (**Figure 37**) begins at DW-1 and continues along the direction of groundwater flow (south-southeast) to the BP-3 series wells. The PCE-dominant plume is at a higher elevation than the TCE-dominant plume in the vicinity of the CPC site and moves south-southeast to well MW-08A. PCE is detected deeper in the BP-3-series wells, which are the farthest downgradient wells from the CPC site.

Cross section B-B' (**Figure 38**) begins east of A-A' at the EW-7-series wells and continues along the direction of groundwater flow to well MW-7B-R. PCE concentrations observed in wells in this cross section are below the 5 µg/L standard in the EW-2 series wells, DW-2, EW-4B, EW-4C, EW-4D, EW-5, EW-7D, and MW-7B-R. TCE concentrations observed in wells in this cross section are below the 5 µg/L standard in the EW-2 series wells and at wells DW-2, EW-4D, EW-5, and EW-7D.

4.3.4 Comparison to Historic Groundwater Quality

Figures 7 through **29** illustrate the historic trends for VOC concentrations in multiple wells. The following table summarizes the concentration trends of PCE and TCE in each of the wells.

Table 10 – PCE and TCE Concentration Trends in Select Monitoring Wells

Well	Screen Depth[1]	Location	PCE Trend	TCE Trend	Figure
CPC Plume Wells					
DW-1	93-98	South-southwest of CPC	Increasing	Decreasing	Figure 9
SW-1	65-70	South-southwest of CPC	Increasing	Increasing	Figure 10
EW-1A	65-75	Southwest of CPC	Decreasing	Decreasing	Figure 11
EW-5	165-175	South-southeast of CPC	Decreasing	Decreasing	Figure 12
Off-Site Plume(s) Wells					
EW-4A	100-115	East of CPC	Increasing	Increasing	Figure 13
EW-4B	120-130	East of CPC	Slightly decreasing	Slightly decreasing	Figure 14
EW-4C	145-155	East of CPC	Decreasing	Decreasing	Figure 15
EW-4D	285-295	East of CPC	Decreasing	Decreasing	Figure 16
EW-7C	189-199	Upgradient, North of CPC	Slightly decreasing	Slightly decreasing	Figure 17
EW-7D	273-283	Upgradient, North of CPC	Decreasing	Decreasing	Figure 18
MW-10D	346-351	Southeast of CPC	Slightly decreasing	Increasing	Figure 19
EW-12D	209-219	East of CPC	Increasing	Increasing	Figure 20
EW-14D	185-195	Southeast of CPC	Decreasing	Decreasing	Figure 21
BP-3A	54-74	South-southeast of CPC	Decreasing	Decreasing	Figure 22
BP-3B	215-235	South-southeast of CPC	Decreasing	Decreasing	Figure 23
BP-3C	280-300	South-southeast of CPC	Decreasing	Decreasing	Figure 24

Well	Screen Depth(1)	Location	PCE Trend	TCE Trend	Figure
MW-11A	140-145	South-southeast of CPC	Increasing	Increasing	Figure 25
MW-11B	240-245	South-southeast of CPC	Increasing	Increasing	Figure 26
MW-7B-R	230-235	South-southeast of CPC	Decreasing	Decreasing	Figure 27
Extraction Wells and OU5 Plant Influent					
RW-3	163-255	Extraction well south-southeast of CPC	Decreasing	Slightly decreasing	Figure 28
RW-4	147-250	Extraction well south-southeast of CPC	Decreasing	Decreasing	Figure 29
RW-5	153-263	Extraction well south-southeast of CPC	Decreasing	Decreasing	Figure 30
OU5 Plant Influent	NA	Plant influent	Slightly decreasing	Increasing	Figure 31

(1) Screen depths given in feet below ground surface.

Decreasing trends indicate mass removal from groundwater in the area around the well. Increasing and stable trends indicate partial capture and/or additional source(s) contributing to groundwater contamination in the area of the well.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The fourth quarter of 2024 groundwater monitoring event at the CPC site covered the on-site plume (OU-4), off-site plume (OU-5), and the downgradient area covered by the MW-CPC series monitoring wells. Analysis of the data has resulted in the following conclusions:

- A groundwater plume of VOCs, primarily PCE, originates proximate to the former CPC Process Building (on-site plume). Recent data obtained from OU-4 monitoring well SW-1, indicates localized PCE concentrations have increased since the cessation of OU-4 pumping in 2016. However, the Remedial System Optimization (RSO) report for the OU-5 GWE&T concluded that the combined capture zone of recovery wells RW-3, RW-4 and RW-5 captures the estimated width of the OU-4 plume migrating directly south from the CPC Site (HDR, 2019).
- An off-site, upgradient plume consisting mostly of TCE originates to the north or northwest of the former CPC site. The TCE contamination was only partially capturedby the CPC OU-4 GWE&T system. Similarly, the combined capture zone of OU-5 recovery wells RW-3, RW-4 and RW-5 is not sufficient to capture the upgradient TCE plume, only extending about 200 feet to the east of RW-4, the eastern-most recovery well based on the RSO report finding (HDR, 2019).
- The OU-5 GWE&T system influent concentrations of PCE, TCE, and cis-1,2-DCE decreased between the second and third quarters of 2022 when recovery wells RW-4 and RW-5 were inoperable. However, influent concentrations increased from the third quarter of 2022 through the fourth quarter of 2024 (see **Figure 31**). A total of 21.42 kilograms (47.22 pounds) of PCE, TCE, and 1,1-DCE combined were removed during the fourth quarter 2024 via operation of the OU-5 GWE&T system. See **Table 5** for specific removal quantities.
-
- Contaminant concentrations in effluent groundwater samples collected during the reporting period met discharge limits.
- The results from the fourth quarter 2024 groundwater sampling event show the following VOC compounds detected above the NYSDEC Part 703 Class GA groundwater criteria: PCE, TCE, cis-1,2-DCE, VC, 1,1-DCE, 1,2-DCA, 1,1,1 TCA, acetone, and benzene.
- BP-3: HDR previously concluded that the current OU-5 recovery well network is not capable of capturing groundwater contamination around the BP-3 series of wells (as indicated by the fluctuation of PCE concentrations at the time, and that it is possible that contaminant mass is migrating beneath the limited influence of the combined capture zones of RW-3, RW-4, and RW-5 in the deeper aquifer. However, overall trends of PCE, TCE, cis-1,2-DCE, VC, and 1,1,1 TCA are decreasing which suggests that capture is likely.
- TCE concentrations at MW-7B-R have continued to show a decline since treatment was transferred from the OU-4 facility to the OU-5 facility. TCE concentrations are approximately one order of magnitude lower than concentrations following the shutdown of OU-4 (see **Figure 27**). This reduction is likely due to the OU-5 recovery wells intercepting the contaminant mass, given the well's position downgradient of the OU-5 recovery wells.
- The direction of groundwater flow at the site remains predominately south-southeast with no regionally significant changes observed in flow direction during operation of the OU-4 GWE&T system or since operation ceased.
- The results from the fourth quarter 2024 groundwater sampling event show 1,4- dioxane was detected above the NYSDOH Maximum Contaminant Level of 0.35 µg/L at five of the

downgradient MW-CPC series monitoring wells: MW-CPC-36, MW-CPC- 37, MW-CPC-38, MW-CPC-40, and MW-CPC-41. The highest result values were found in MW-CPC-36 and MW-CPC-37 which are upgradient from a public water supply well N-07852 (**Figure 33**).

- PFOS and PFOA continue to be the dominant PFAS compounds detected at the MW-CPC series of wells. Exceedances are limited to MW-CPC-36, MW-CPC-37, and MW-CPC-41, which are located approximately upgradient to side gradient of the public water supply wells (**Figure 34**). Total PFAS results remain highest in MW-CPC-36.
- Resumption of monthly sampling of OU5 plant influent and effluent for emerging contaminants began in August 2022. Exceedances of 1,4-dioxane in influent and effluent samples, as well as PFOS, and PFOA in influent samples, were reported in the fourth quarter. As discussed in **Section 3.1.2.**, a GAC treatability study was conducted between April 26, 2024 through September 17, 2024 in an effort to evaluate treatment of PFAS in extracted groundwater. Results associated with the GAC treatability study will be detailed under separate cover in a forthcoming Treatability Study Report.

5.2 Recommendations

- Recondition recovery wells RW-3, RW-4, and RW-5 to improve performance and well efficiency which may improve contaminant mass removal.
- Evaluate defective, non-functioning, and critical components of the conveyance and treatment system to confirm the capacity of the piping system, condition of conveyance vaults, adequacy of treatment and recharge, and potential modifications as deemed necessary. Perform repairs to components adversely affecting current capacity and treatment (e.g. replacing defective air inlets on conveyance line).
- Determine vertical extent of TVOC contamination and depth of clay units at the location of the recovery wells and horizontal and vertical extent of the plume to the east by installing vertical profile borings (VPB) between RW-3 and RW-4 and east of monitoring well EW-14D.
- Based on the findings of the VPB investigation, upgrade and/or expand the system with additional extraction wells. Upgrade via installation of new pumps/motors in one or more of the existing recovery wells to increase pumping capacity and extend capture to the east. Install one or two new extraction wells screened deeper and further east.
- Recovery wells RW-1 and RW-2 should remain offline.
- Upgrade or replace the GWE&T system to treat 1,4-dioxane and PFAS compounds found to be present above New York State’s applicable standards.

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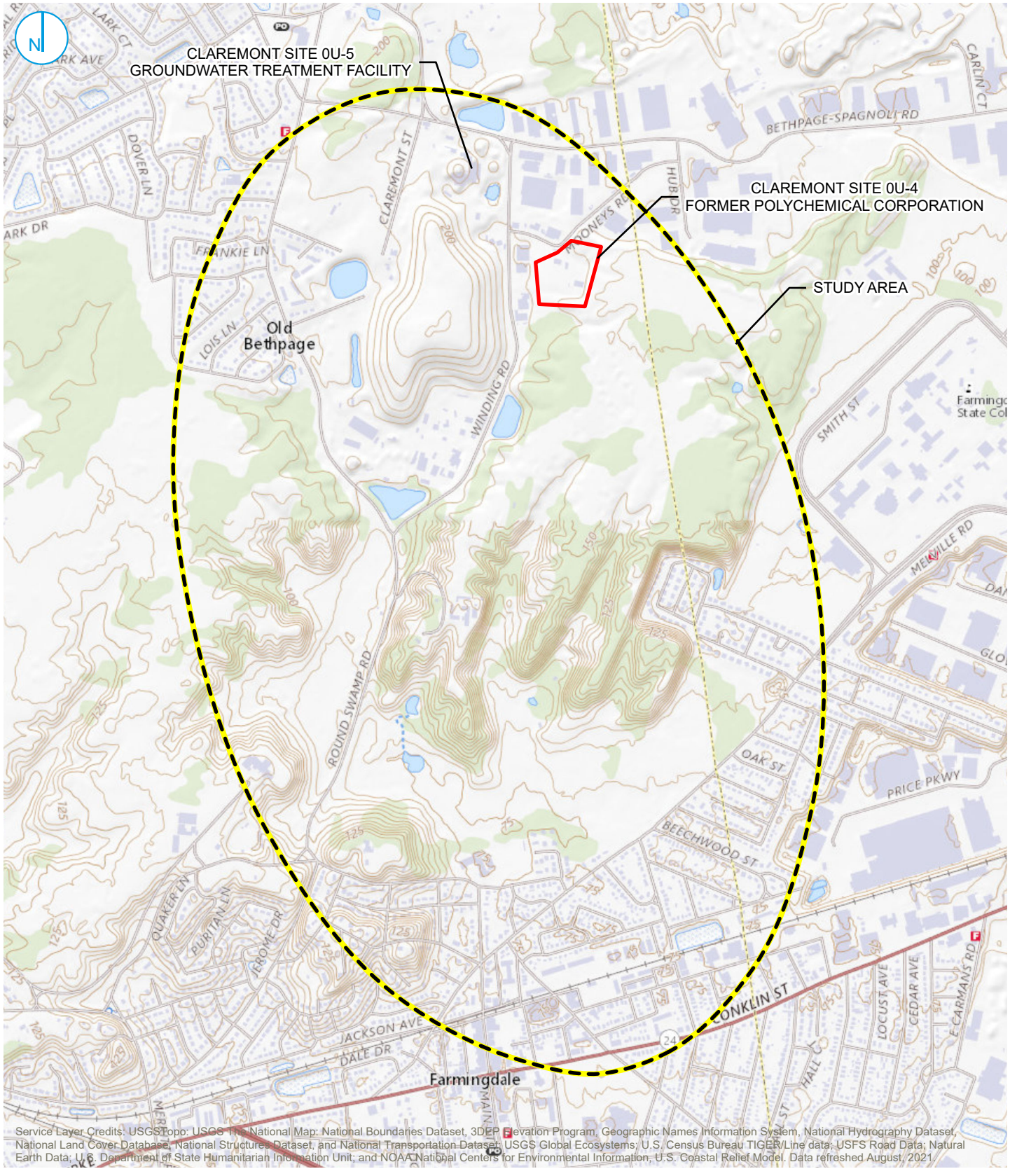
FIGURES



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PROJECT: 169000194010703 | DATED: 4/26/2022 | DESIGNER: SSOULE

Map Scale: 1:24,000 | Map Center: 73°26'43"W 40°44'53"N

KEY MAP (not to scale)

0 1,000 2,000 Feet

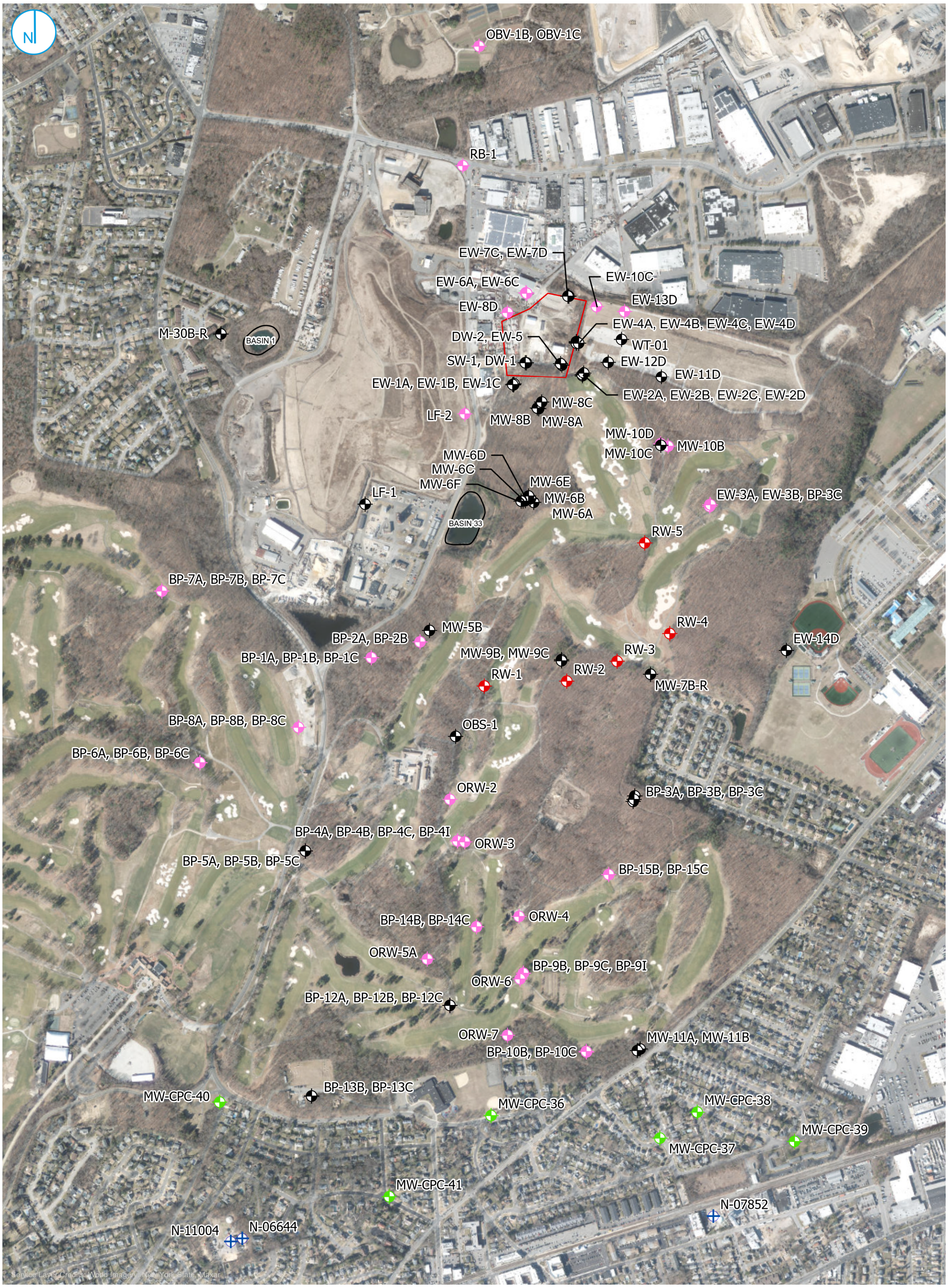
SITE LOCATION

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 01

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



MONITORING WELL
- GAUGED ONLY
- GAUGED AND SAMPLED

- SENTINEL WELL GAUGED AND SAMPLED
- RECOVERY WELL
- MUNICIPAL WELL

- RECHARGE BASIN
- SITE BOUNDARY

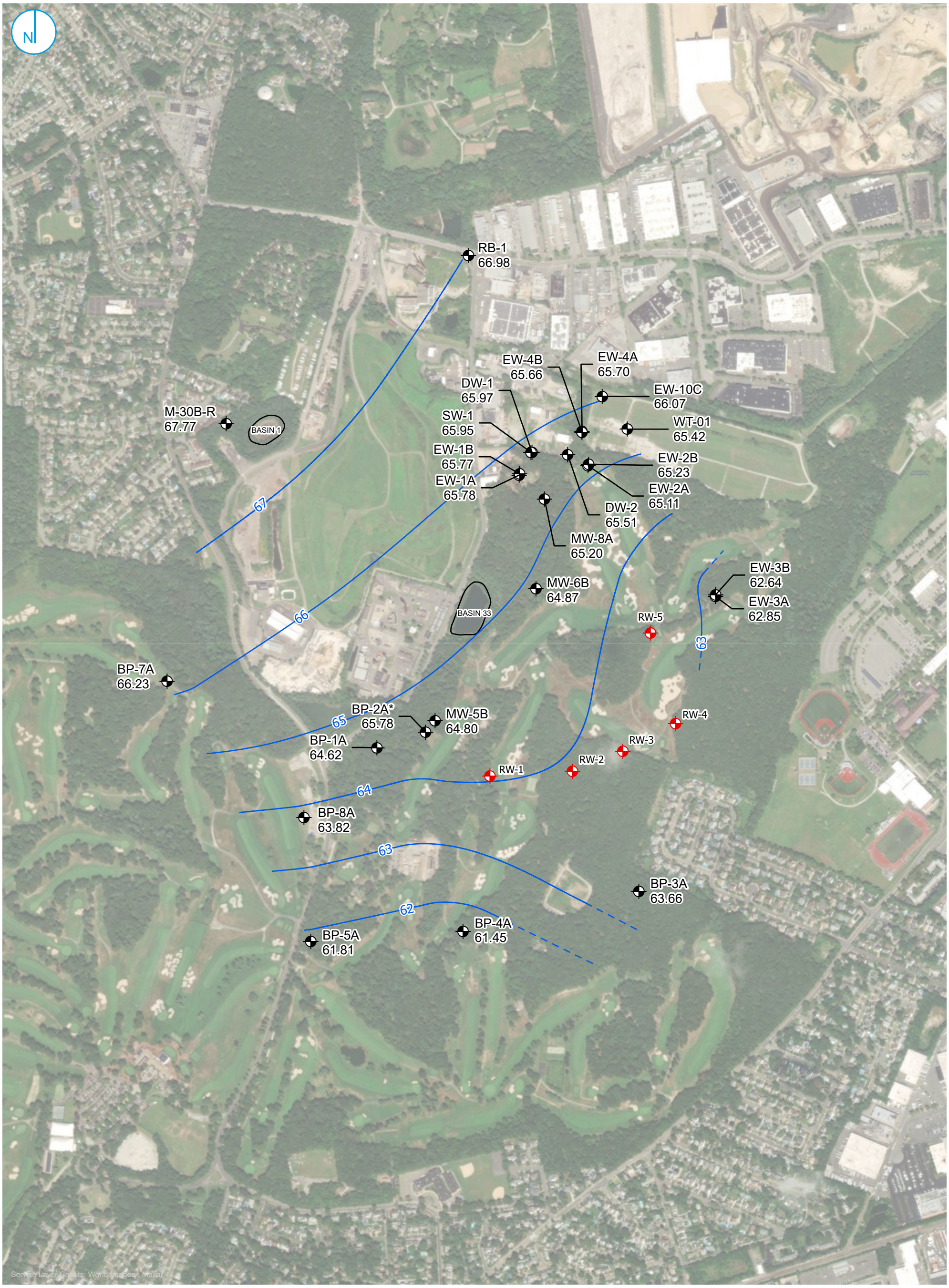
0 400 800 Feet

WELLS SAMPLED

FIGURE 02

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



MONITORING WELL
RECOVERY WELL
POTENTIOMETRIC CONTOUR
INFERRED POTENTIOMETRIC CONTOUR
RECHARGE BASIN

Notes
- * - Well BP-2A was excluded from contour drawing.
- Wells BP-6A and EW-6A were inaccessible and MW-6A had insufficient water.
- All elevations recorded in feet in NAVD 88.

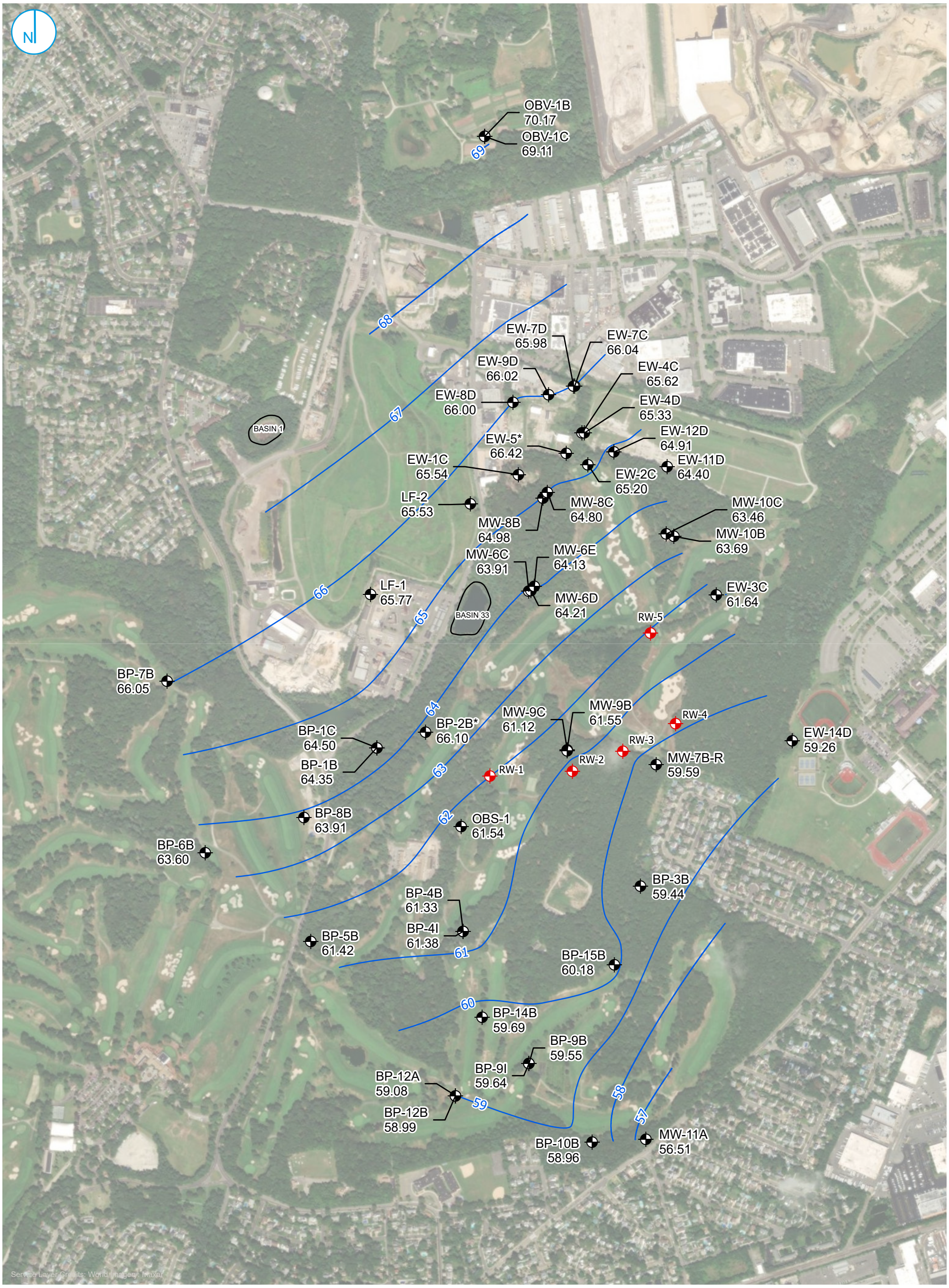
0 400 800 Feet

OCTOBER 2024
POTENTIOMETRIC CONTOURS
UPPER MAGOTHY

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 03

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



MONITORING WELL
RECOVERY WELL
POTENTIOMETRIC CONTOUR
RECHARGE BASIN

0 400 800 Feet

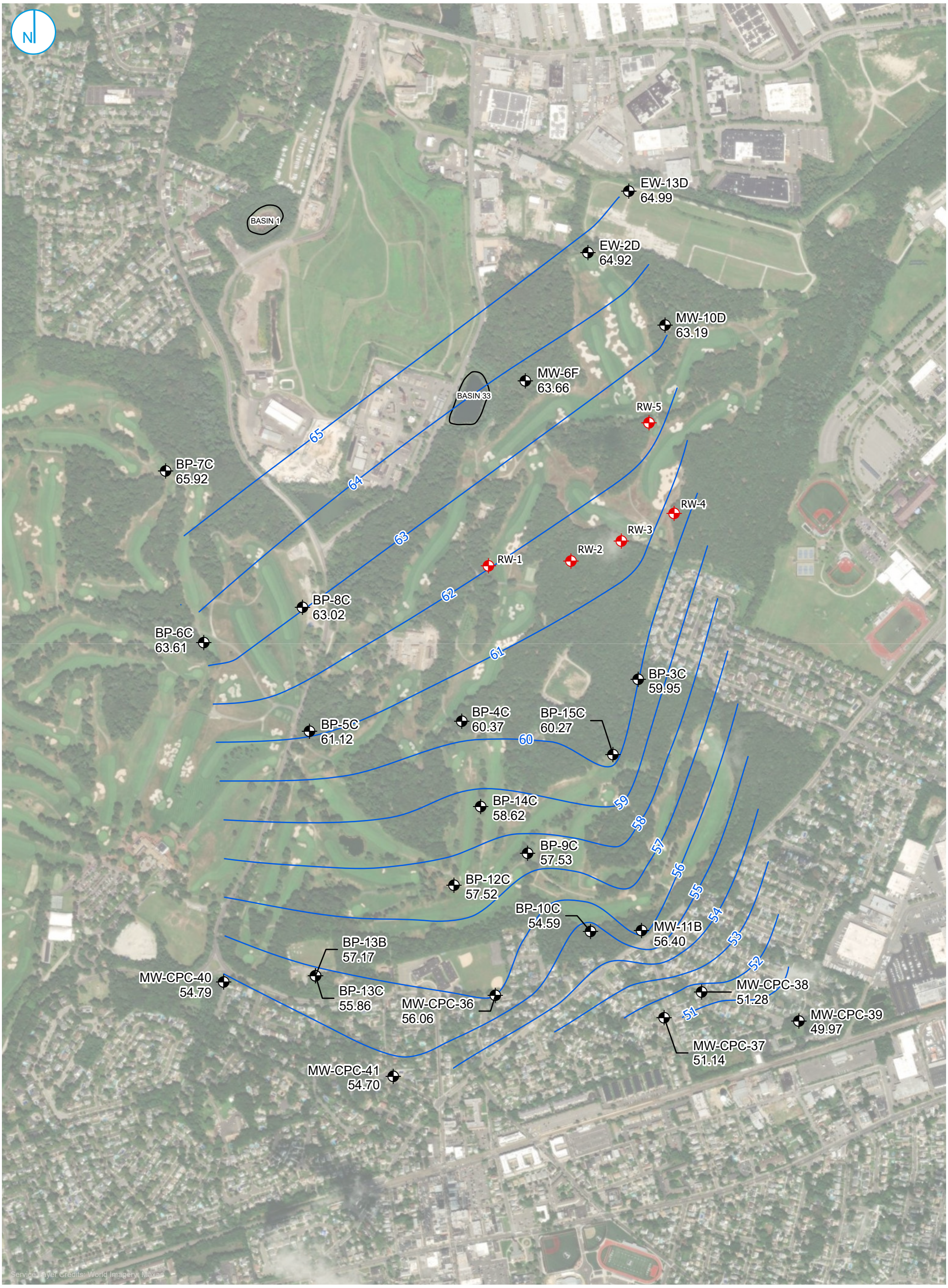
Notes
- * - Wells BP-2B and EW-5 were excluded from contour drawing.
- Well EW-6C was inaccessible and wells ORW-1 through ORW-7 were not gauged.
- All elevations recorded in feet in NAVD 88.

OCTOBER 2024
POTENTIOMETRIC CONTOURS
MIDDLE MAGOTHY

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 04

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



MONITORING WELL
RECOVERY WELL
POTENTIOMETRIC CONTOUR
RECHARGE BASIN

Notes
- All elevations recorded in feet in NAVD 88.

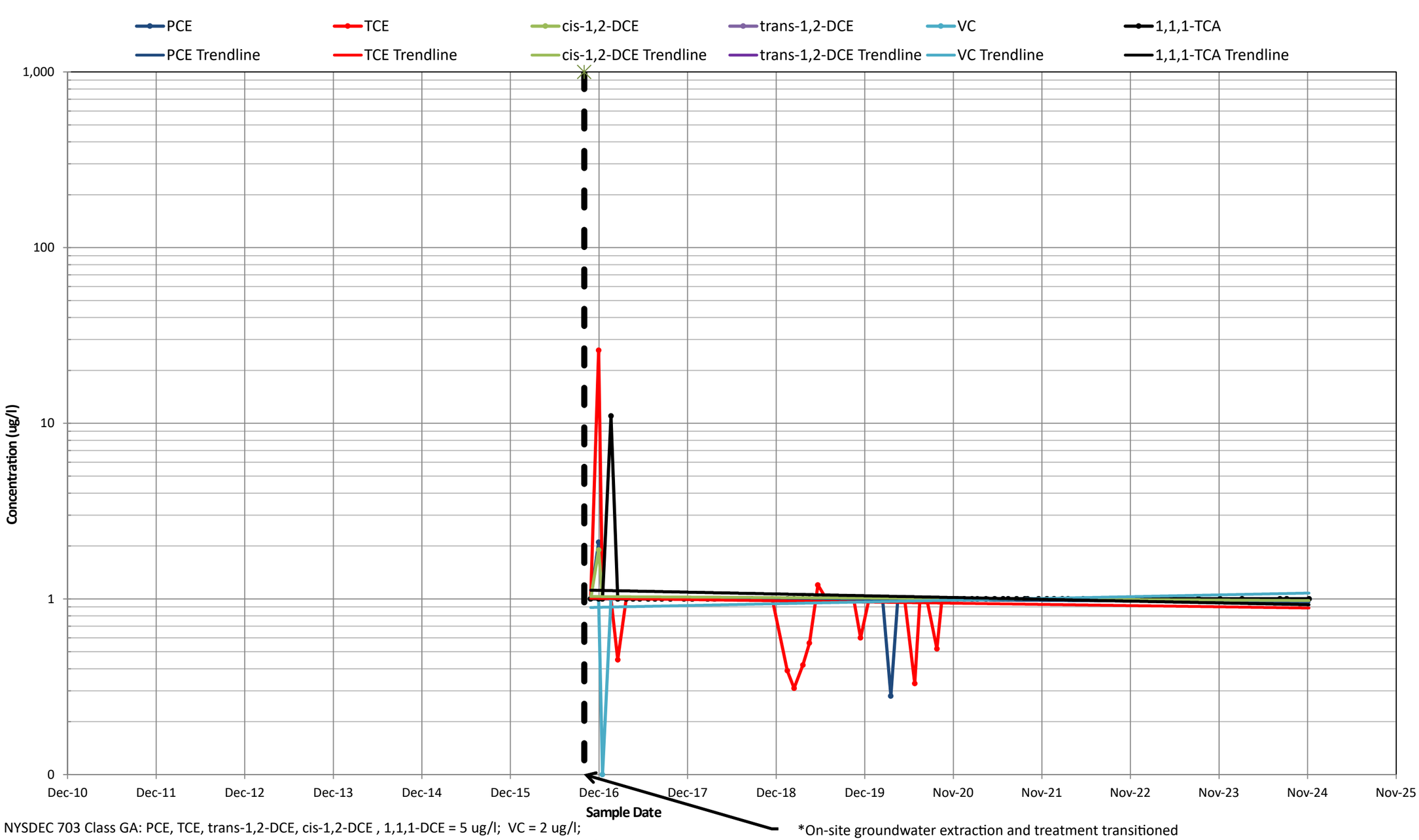
0 400 800 Feet

OCTOBER 2024
POTENTIOMETRIC CONTOURS
LOWER MAGOTHY

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 05

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

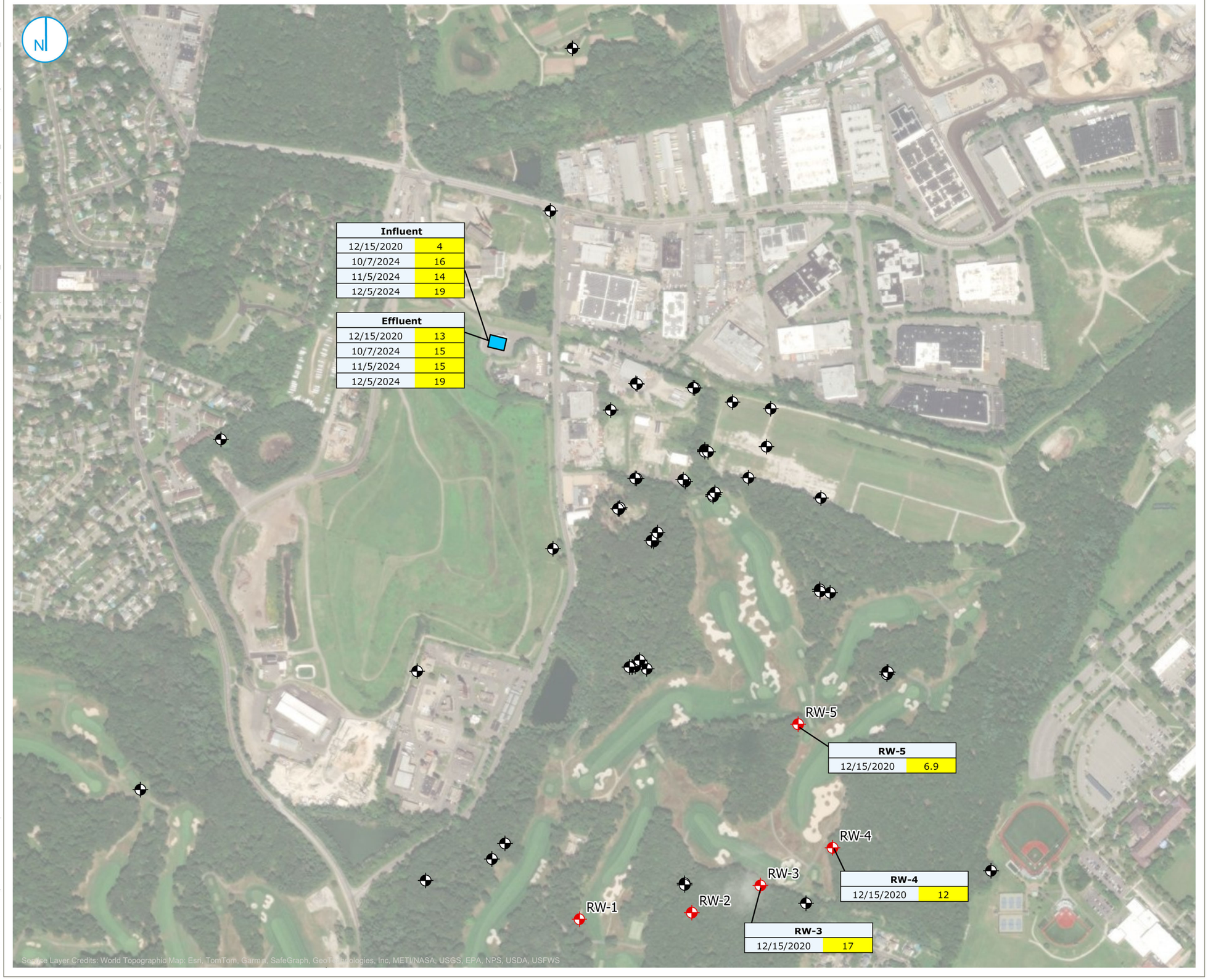
CHLORINATED VOC CONCENTRATIONS
EFFLUENT

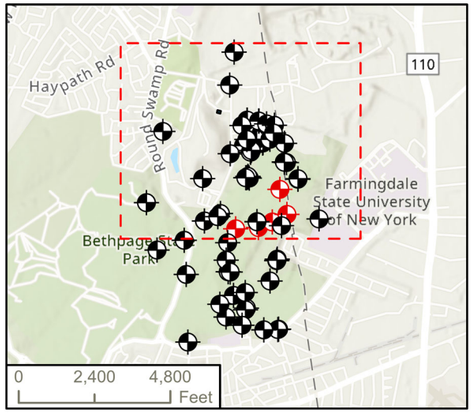
CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 06

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL





MONITORING WELL (GAUGED)
RECOVERY WELL
TREATMENT BUILDING

Process Sample Results Notes:

1. 1,4-Dioxane was compared to the NYSDEC "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. Division of Water Technical and Operational Guidance Series (1.1.1)." Last updated February 2023. Criteria shown on table below.
2. Exceedance of relevant criteria indicated by yellow highlighting in the data box on the map.
3. Final, validated data presented on figure.
4. X / X - Indicates primary / duplicate results.
5. All results presented in ug/L.

Standards / Criteria:	ug/L
1,4-Dioxane	0.35

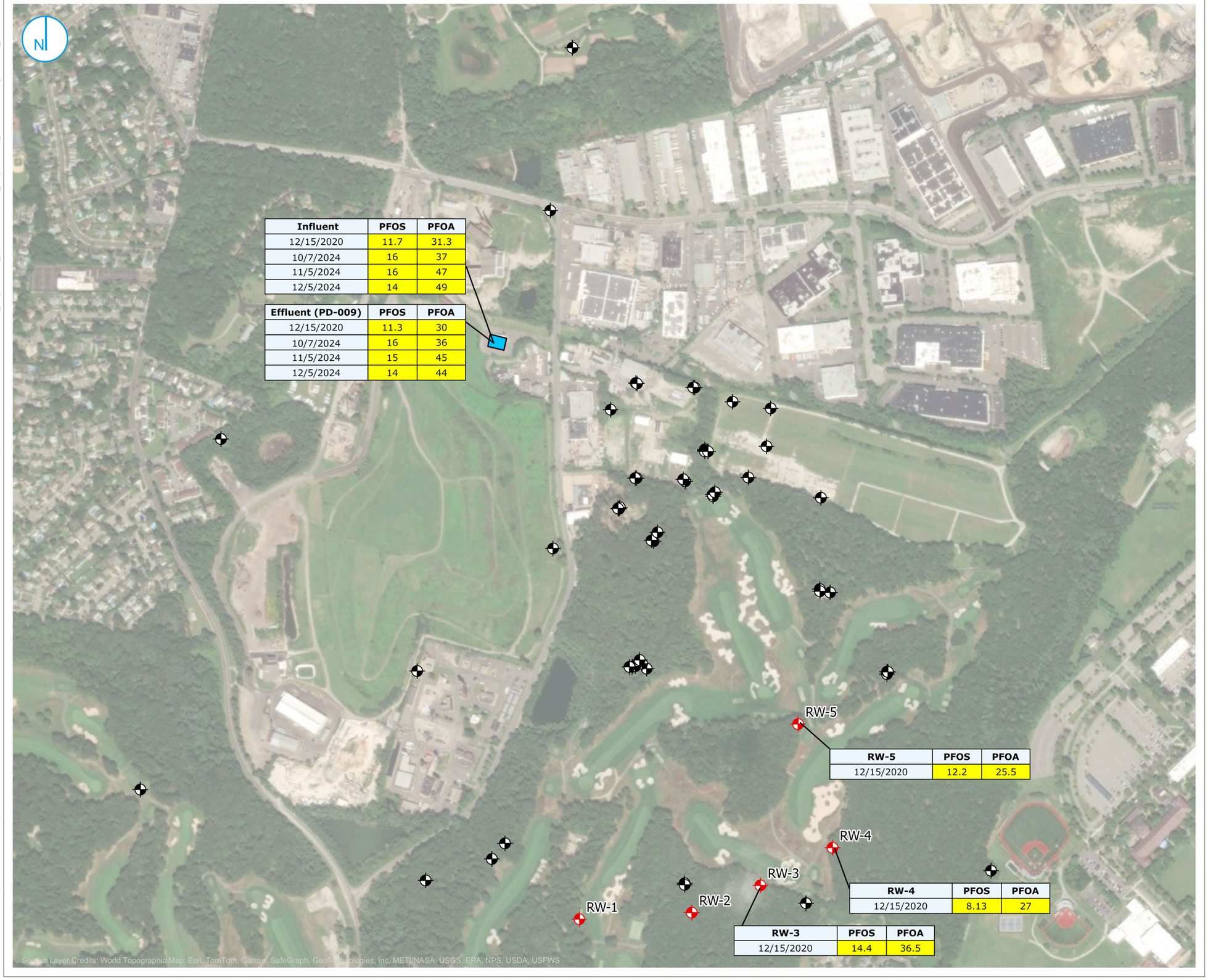
0 300 600 Feet

1,4-DIOXANE EXCEEDANCES IN PROCESS SAMPLES

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 07

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



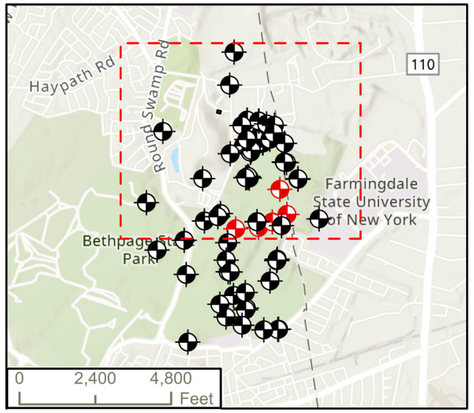
Influent	PFOS	PFOA
12/15/2020	11.7	31.3
10/7/2024	16	37
11/5/2024	16	47
12/5/2024	14	49

Effluent (PD-009)	PFOS	PFOA
12/15/2020	11.3	30
10/7/2024	16	36
11/5/2024	15	45
12/5/2024	14	44

RW-5	PFOS	PFOA
12/15/2020	12.2	25.5

RW-4	PFOS	PFOA
12/15/2020	8.13	27

RW-3	PFOS	PFOA
12/15/2020	14.4	36.5



MONITORING WELL (GAUGED)
RECOVERY WELL
TREATMENT BUILDING

Process Sample Results Notes:

1. PFOS and PFOA were compared to the NYSDEC "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. Division of Water Technical and Operational Guidance Series (1.1.1)." Last updated February 2023.
2. Only compounds with exceedances are shown. If the compound is not shown it was not detected above the criteria in any sample.
3. Criteria for compounds shown on this figure are presented in the table below.
4. Exceedance of relevant criteria indicated by yellow highlighting in the data box on the map.
5. Final, validated data presented on figure.
6. X / X - Indicates primary / duplicate results.
7. All results presented in ng/L.

Standards / Criteria:	ng/L
Perfluorooctanesulfonic acid (PFOS)	2.7
Perfluorooctanoic acid (PFOA)	6.7

0 300 600 Feet

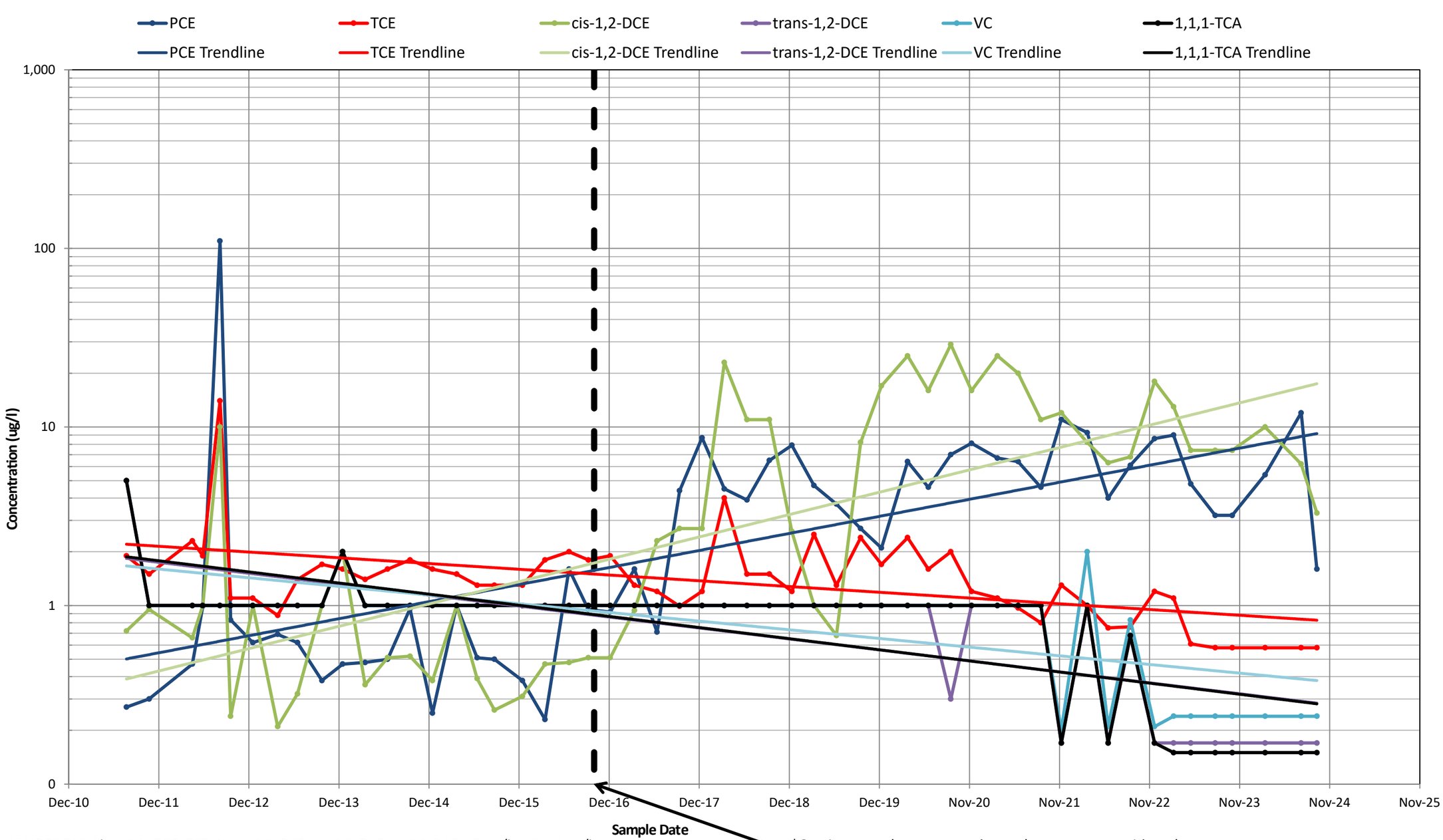
PFAS EXCEEDANCES

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 08

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

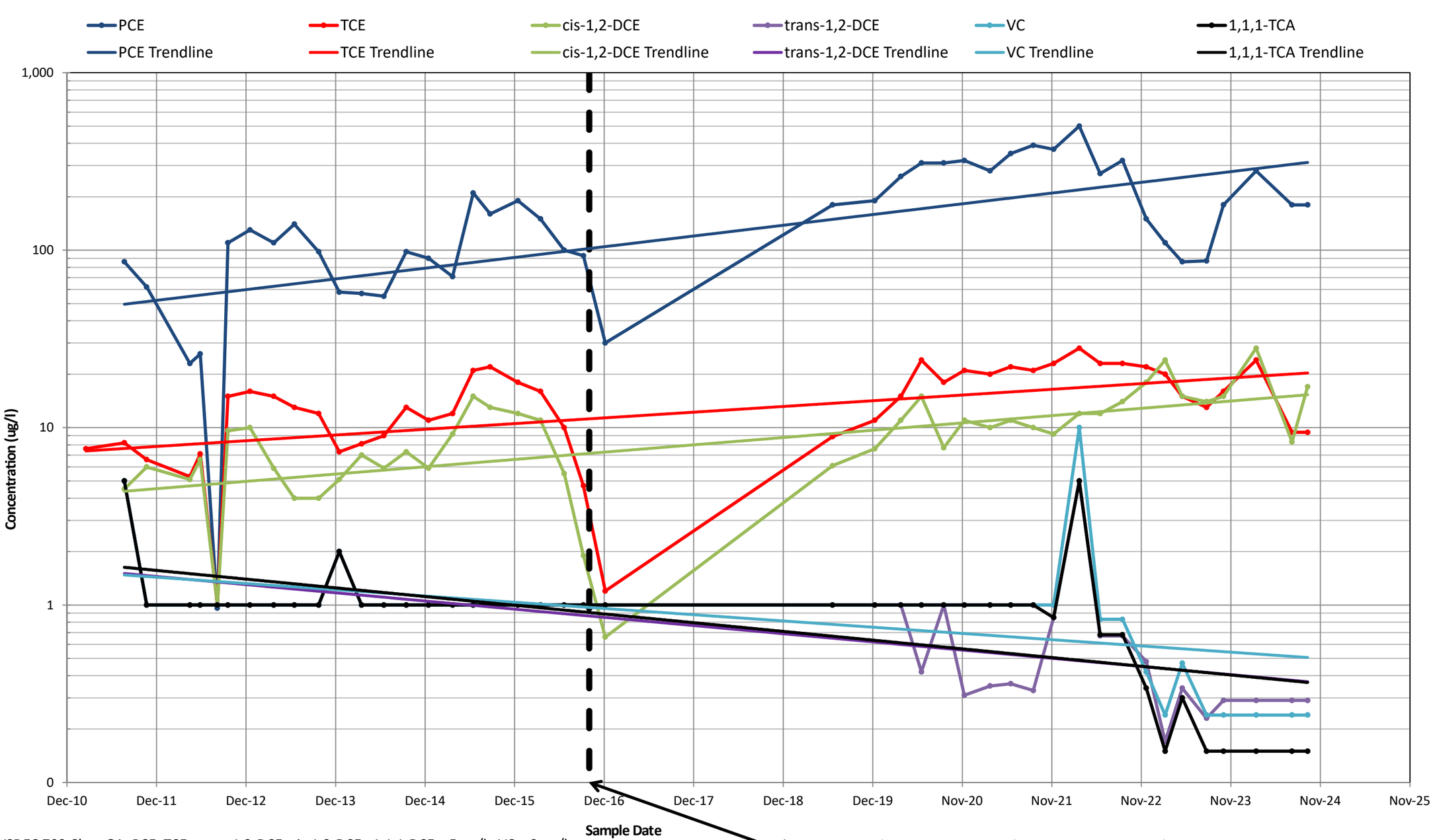
CHLORINATED VOC CONCENTRATIONS
DW-1

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 09

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

Well was dry in for all four quarters of 2017.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

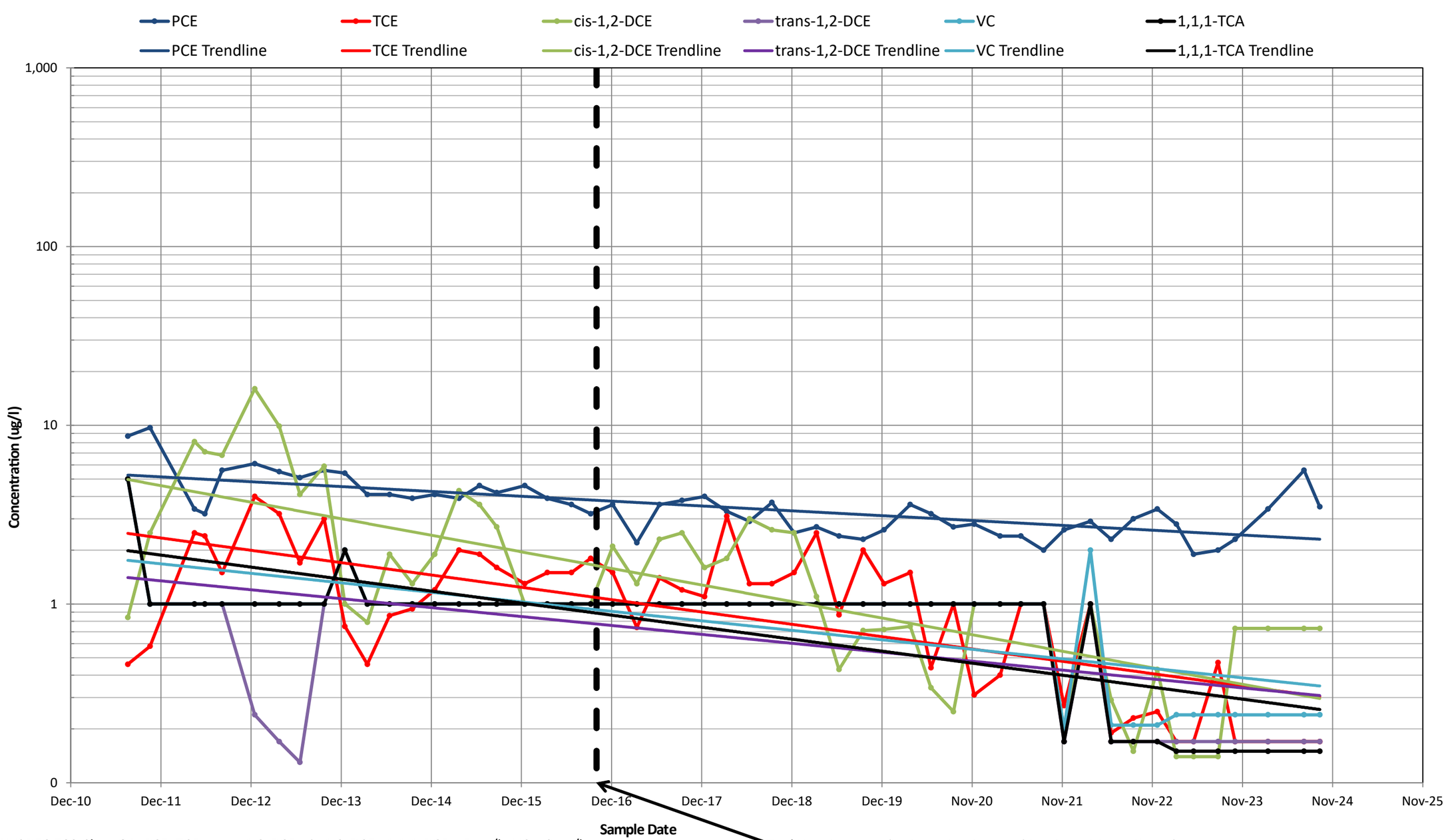
CHLORINATED VOC CONCENTRATIONS
SW-1

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 10

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

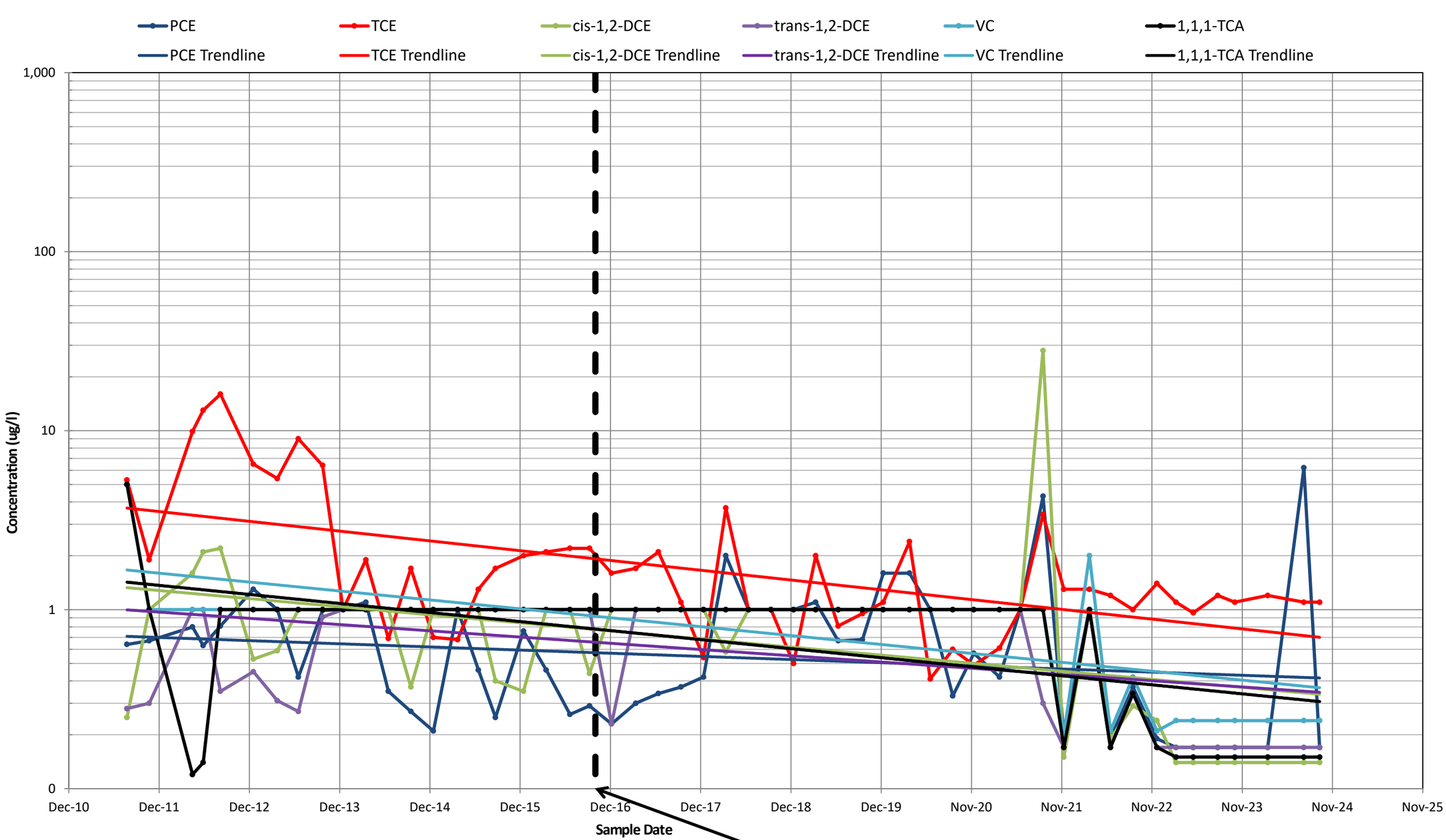
CHLORINATED VOC CONCENTRATIONS
EW-1A

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 11

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

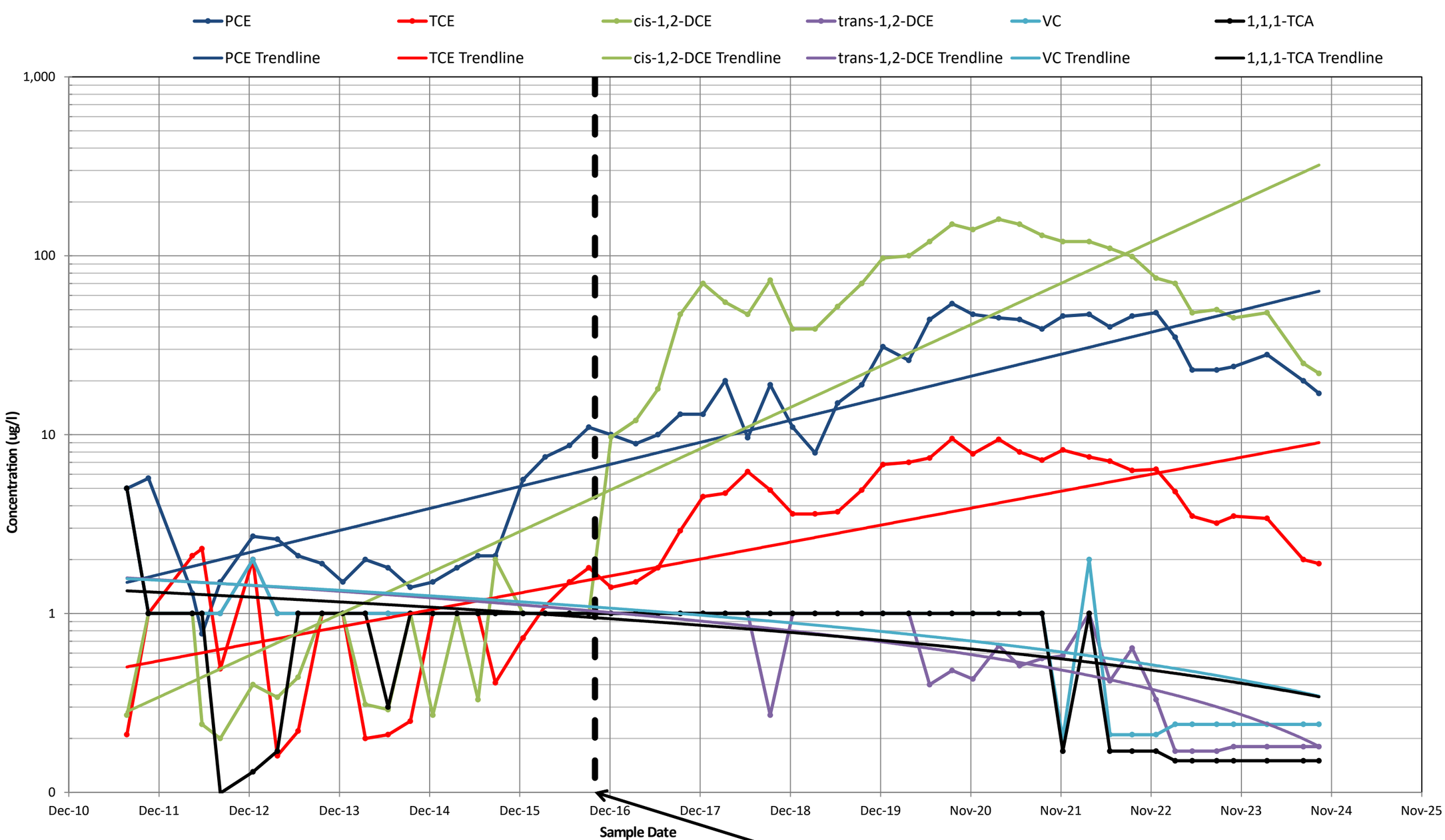
*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

CHLORINATED VOC CONCENTRATIONS
EW-5

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 12

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

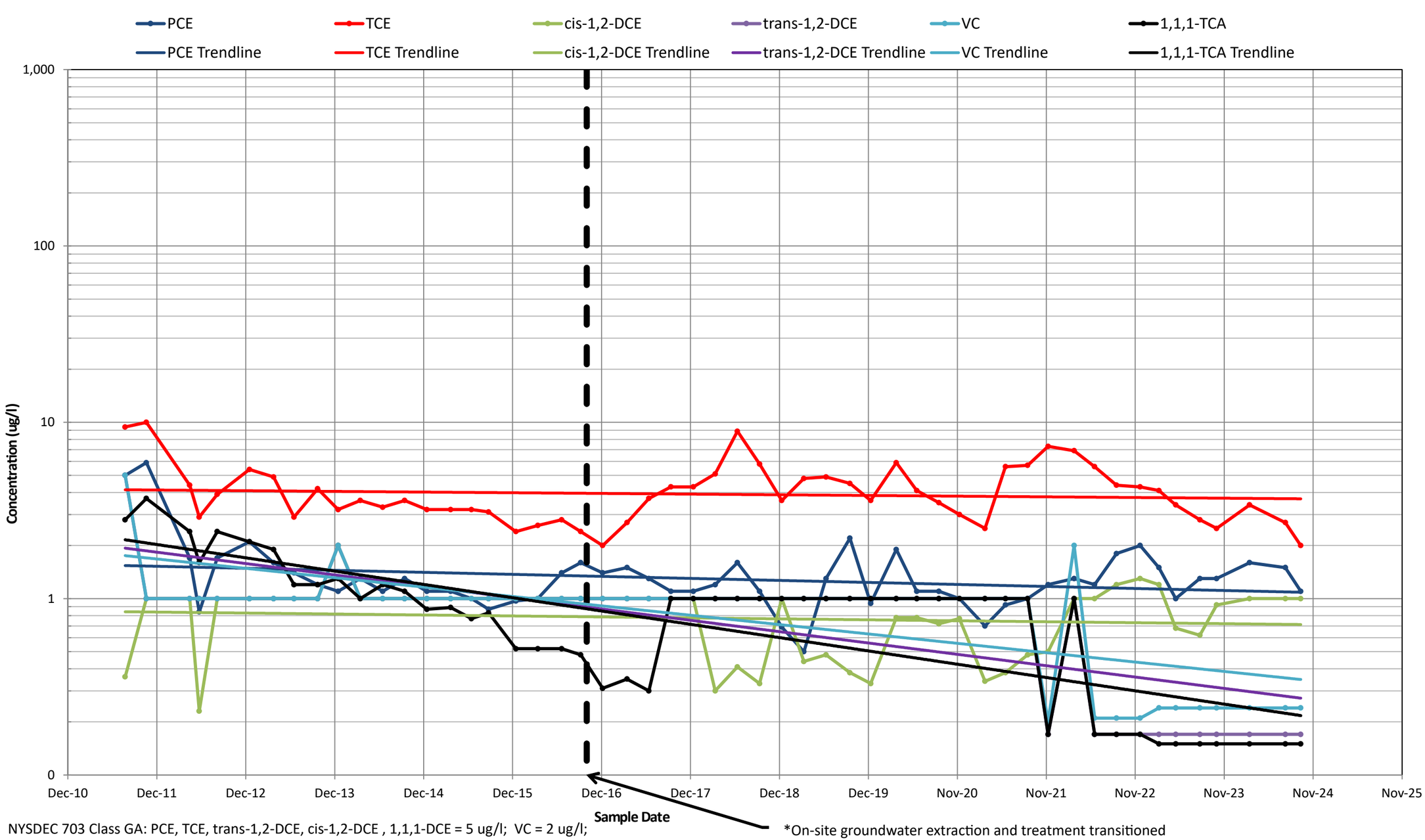
CHLORINATED VOC CONCENTRATIONS
EW-4A

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 13

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

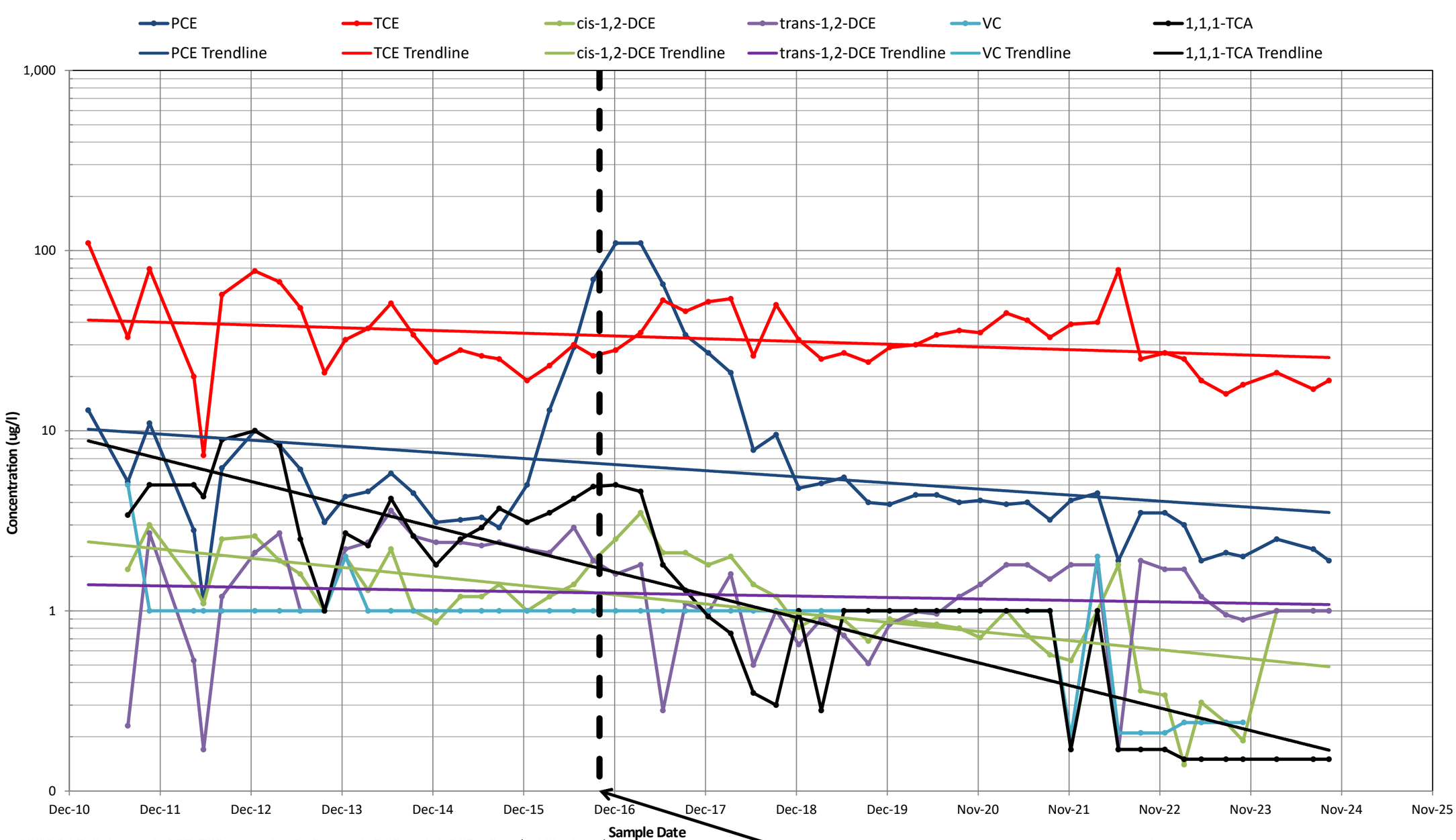
CHLORINATED VOC CONCENTRATIONS
EW-4B

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 14

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

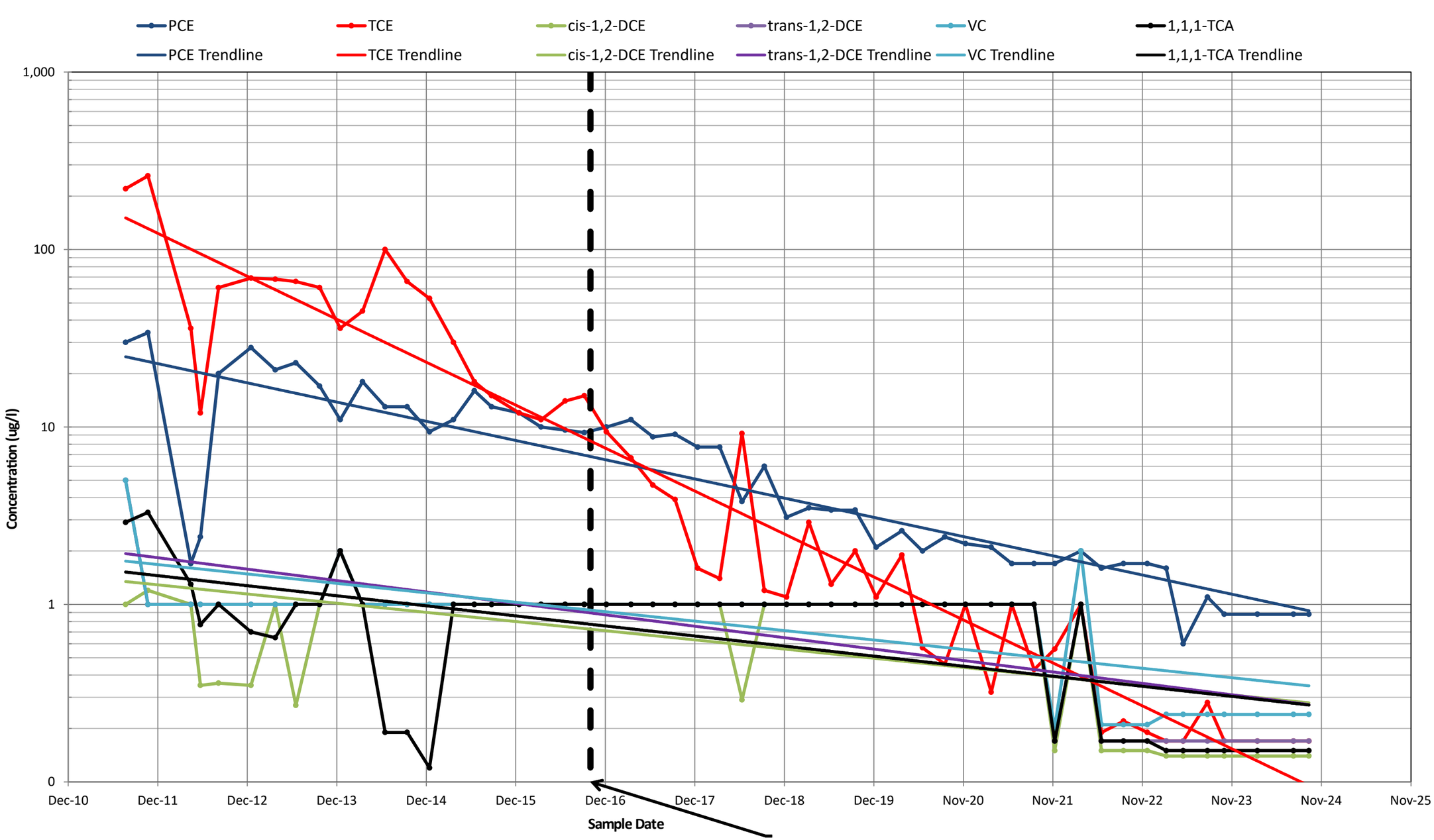
CHLORINATED VOC CONCENTRATIONS
EW-4C

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 15

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

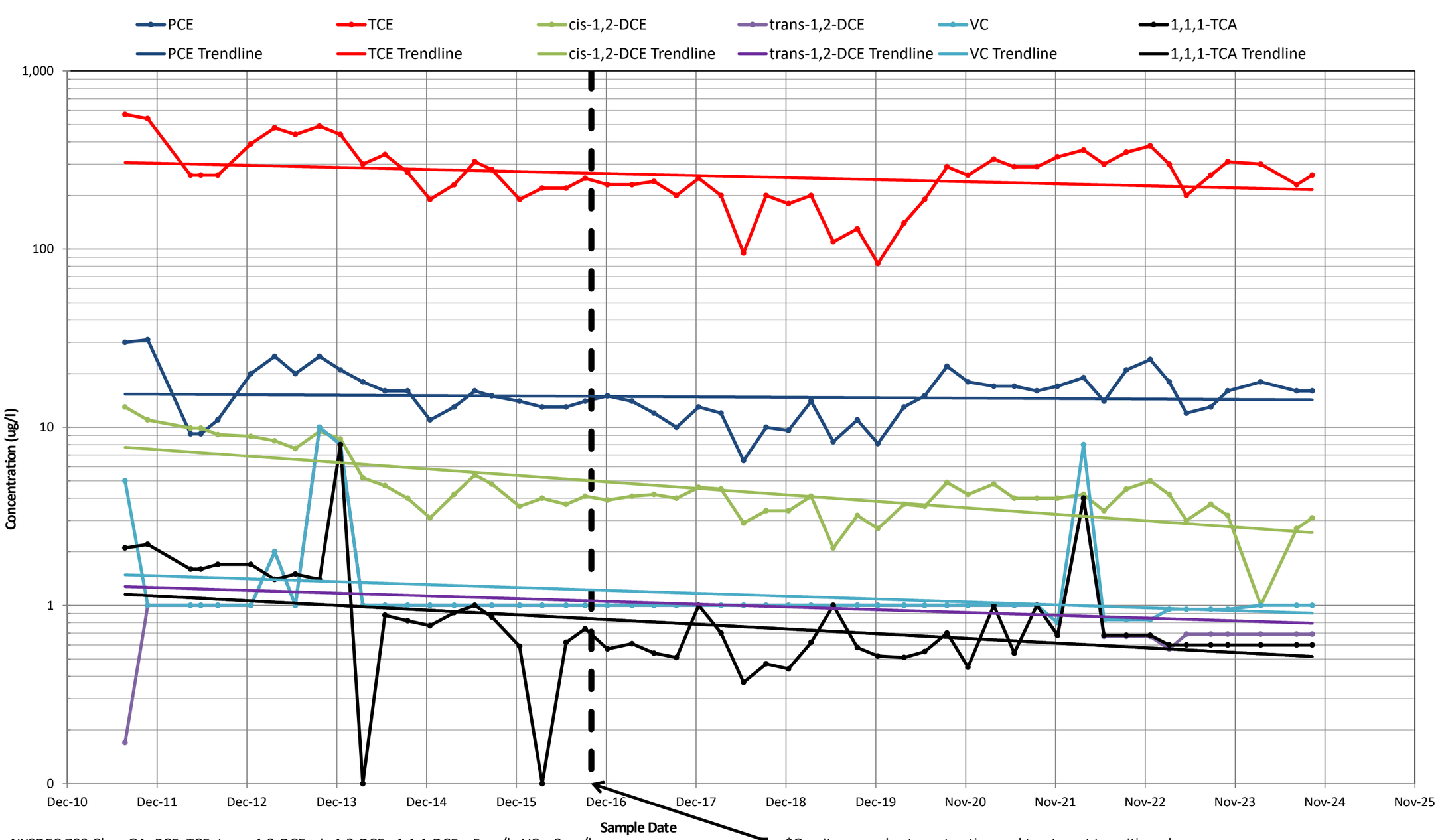
CHLORINATED VOC CONCENTRATIONS
EW-4D

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 16

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

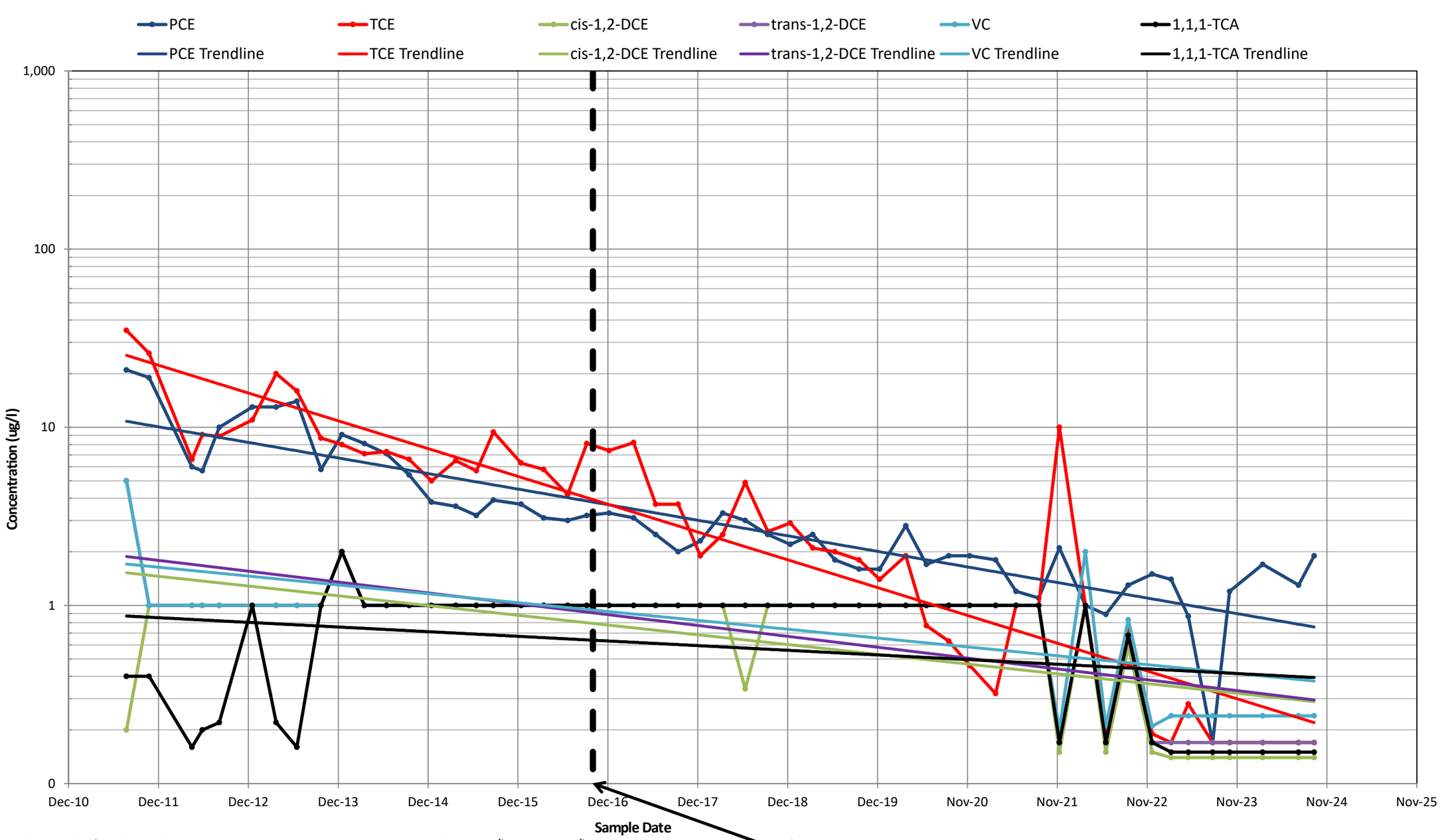
CHLORINATED VOC CONCENTRATIONS
EW-7C

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 17

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

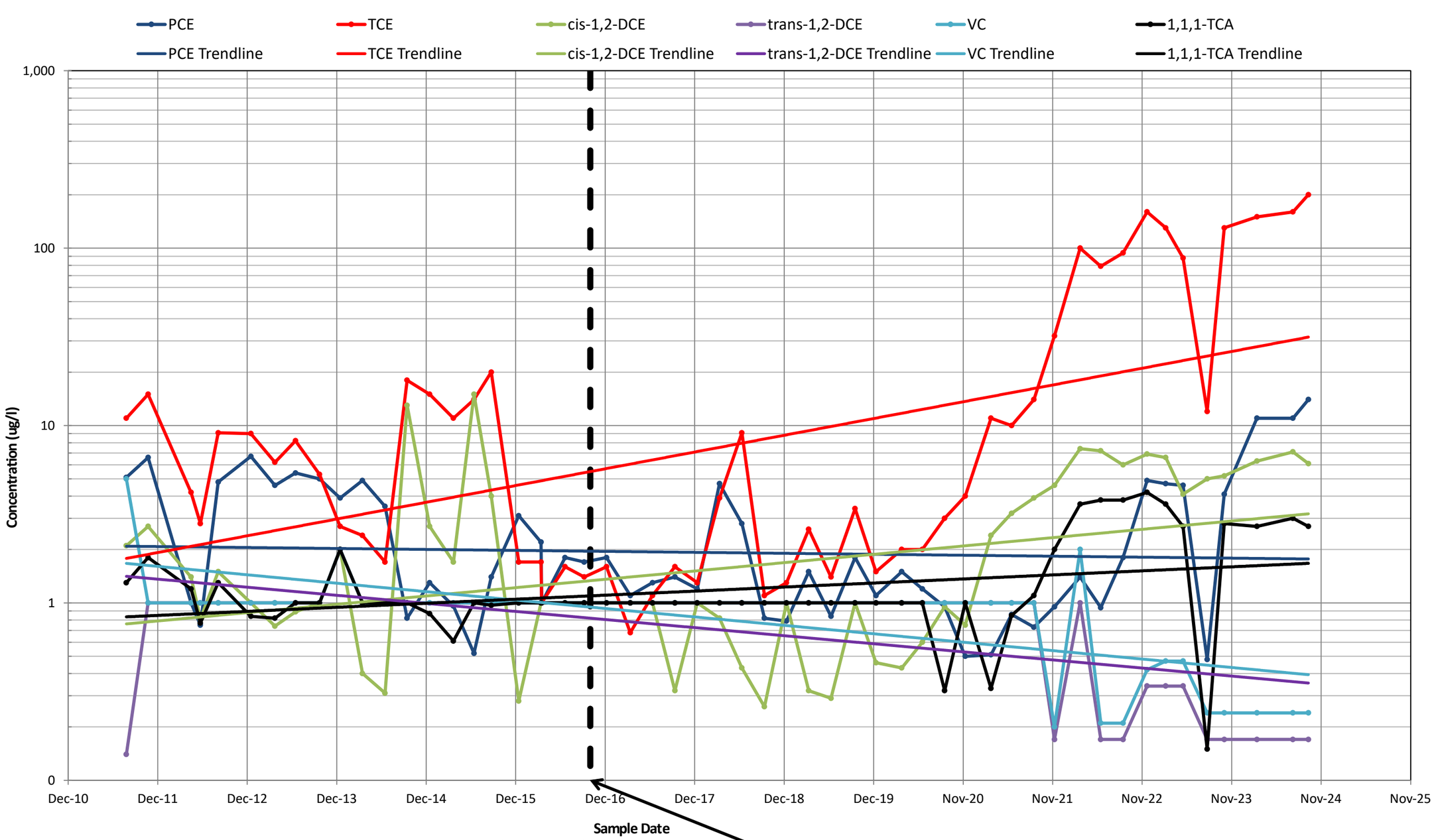
CHLORINATED VOC CONCENTRATIONS
EW-7D

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 18

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

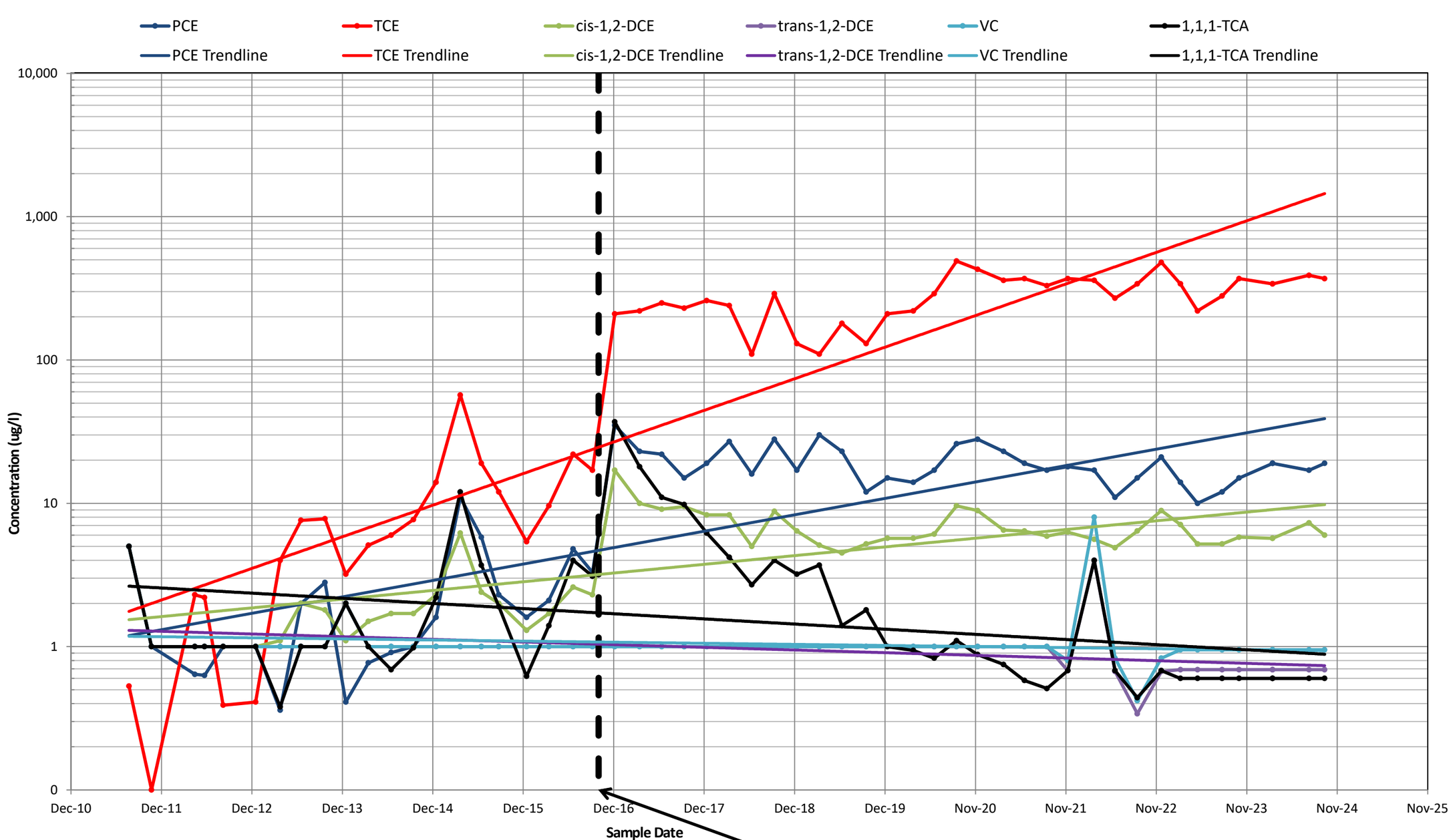
*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

CHLORINATED VOC CONCENTRATIONS
MW-10D

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 19

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

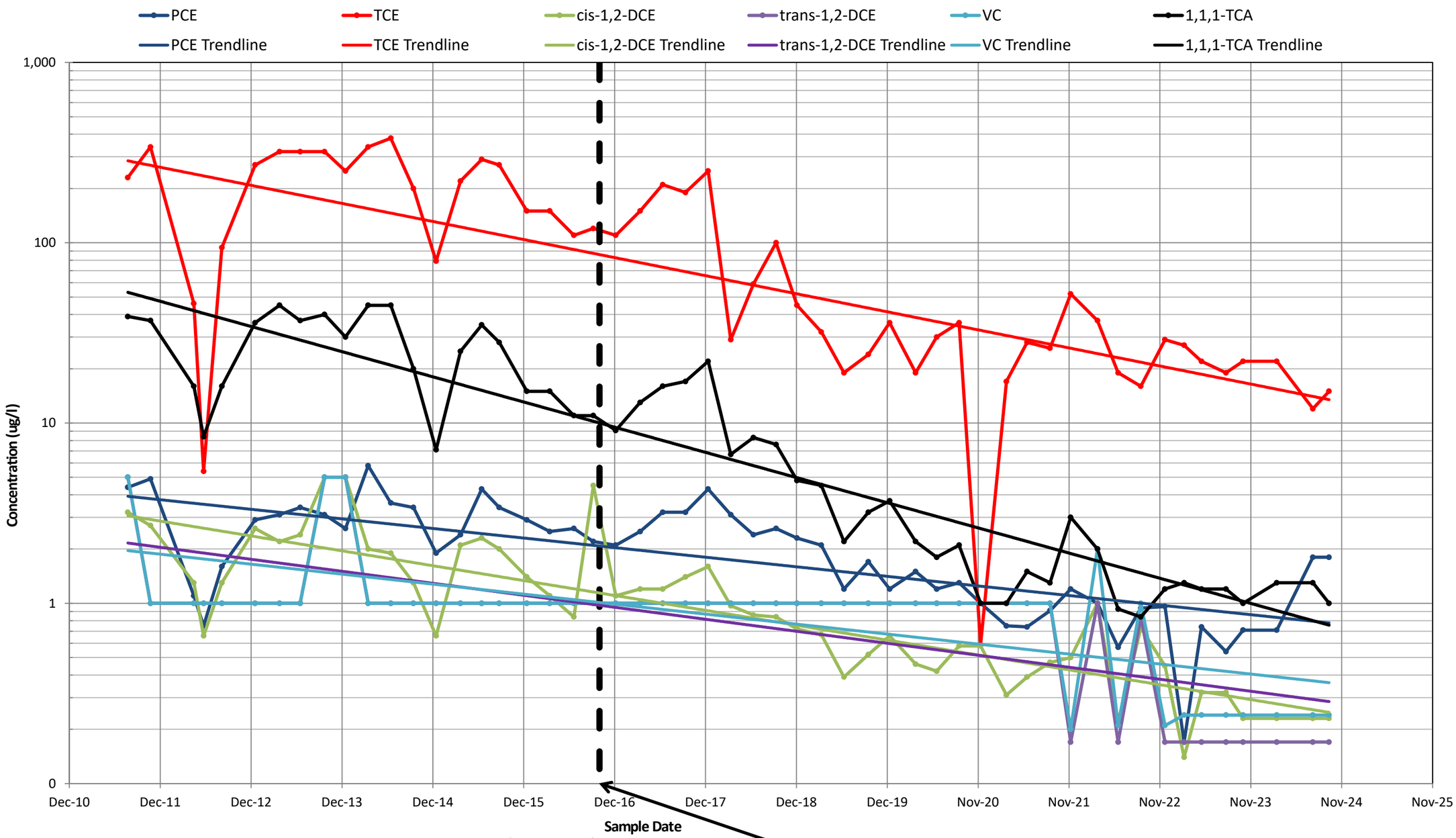
CHLORINATED VOC CONCENTRATIONS
EW-12D

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 20

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

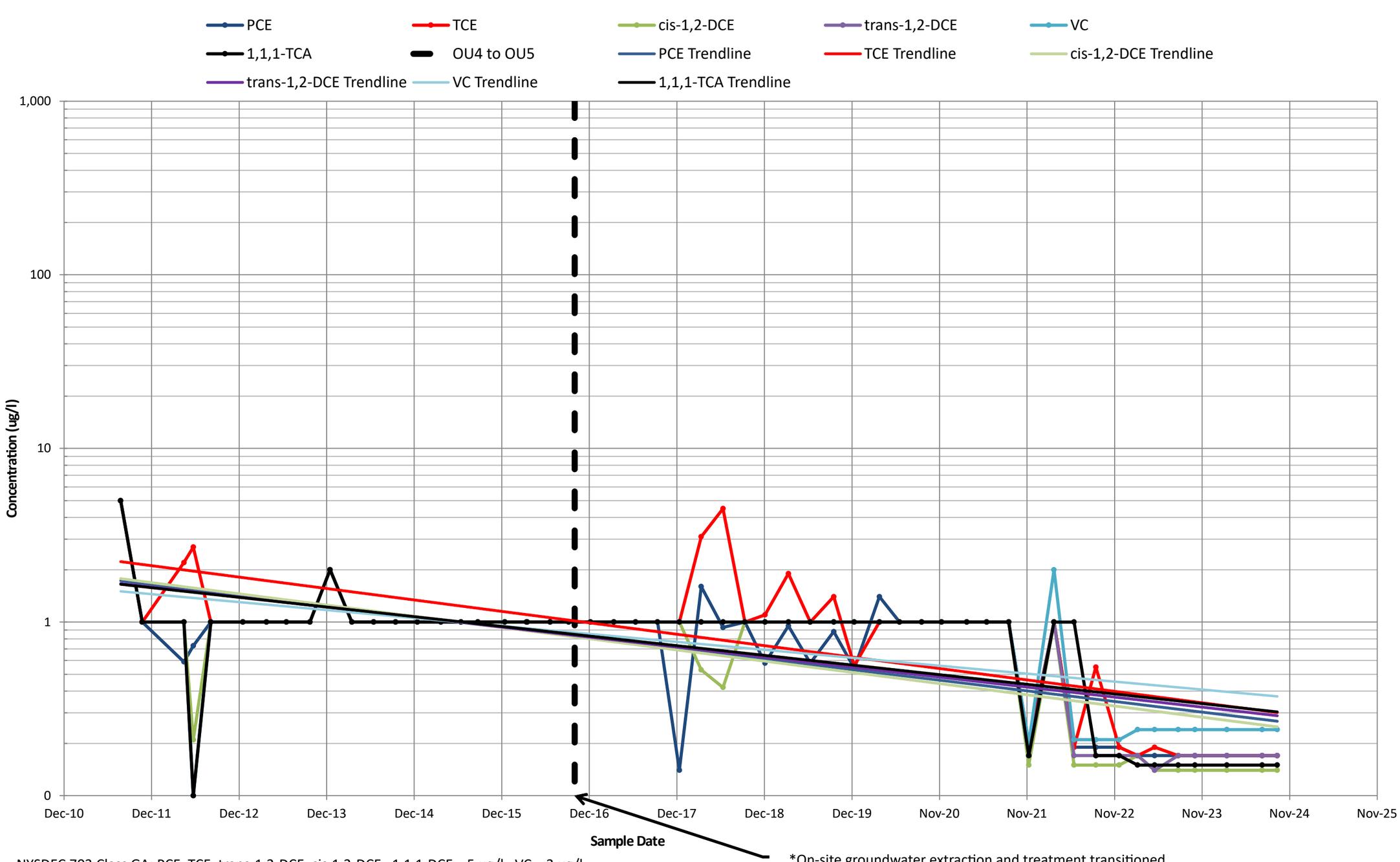
*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

CHLORINATED VOC CONCENTRATIONS
EW-14D

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 21

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

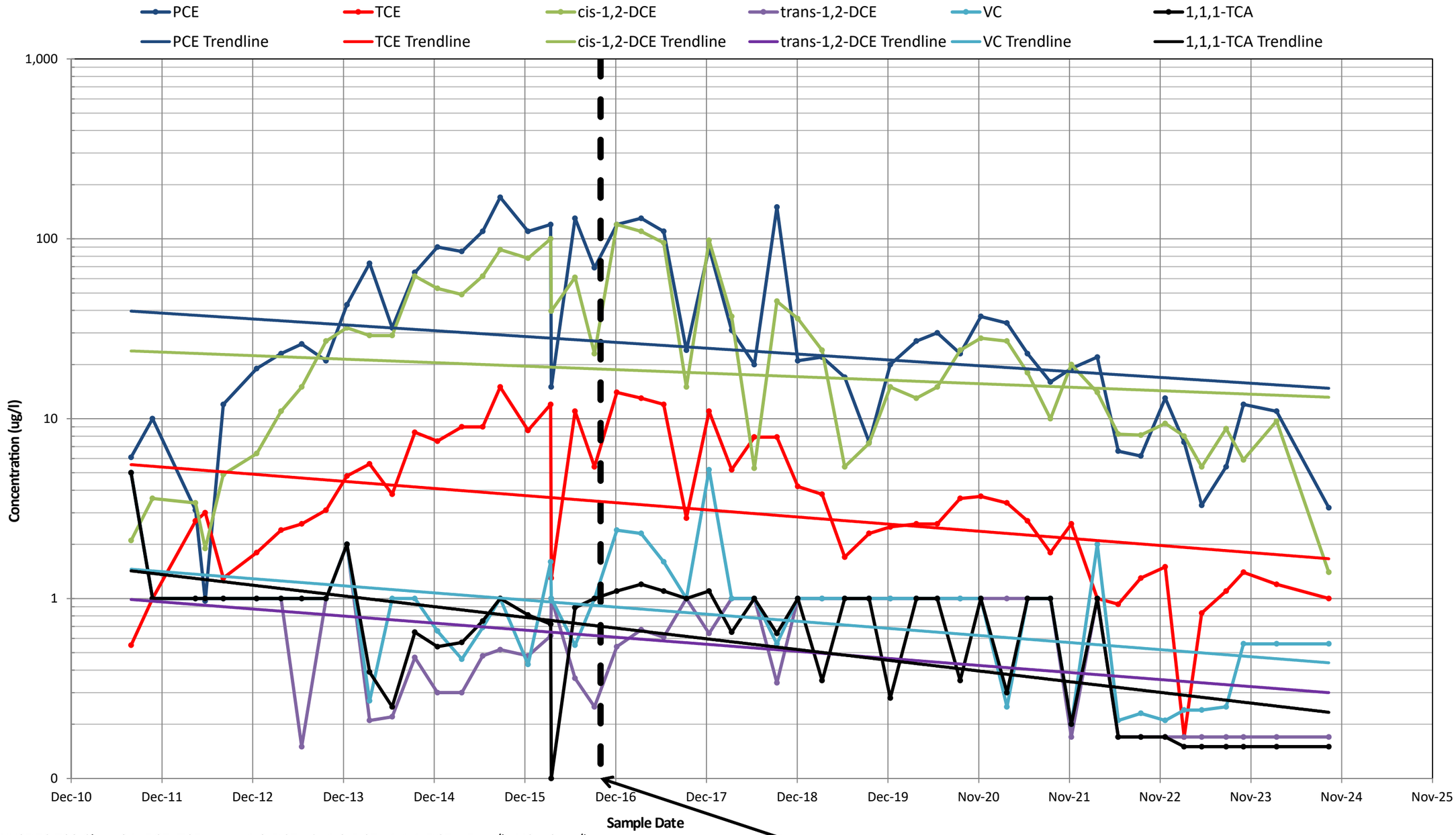
CHLORINATED VOC CONCENTRATIONS
BP-3A

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 22

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

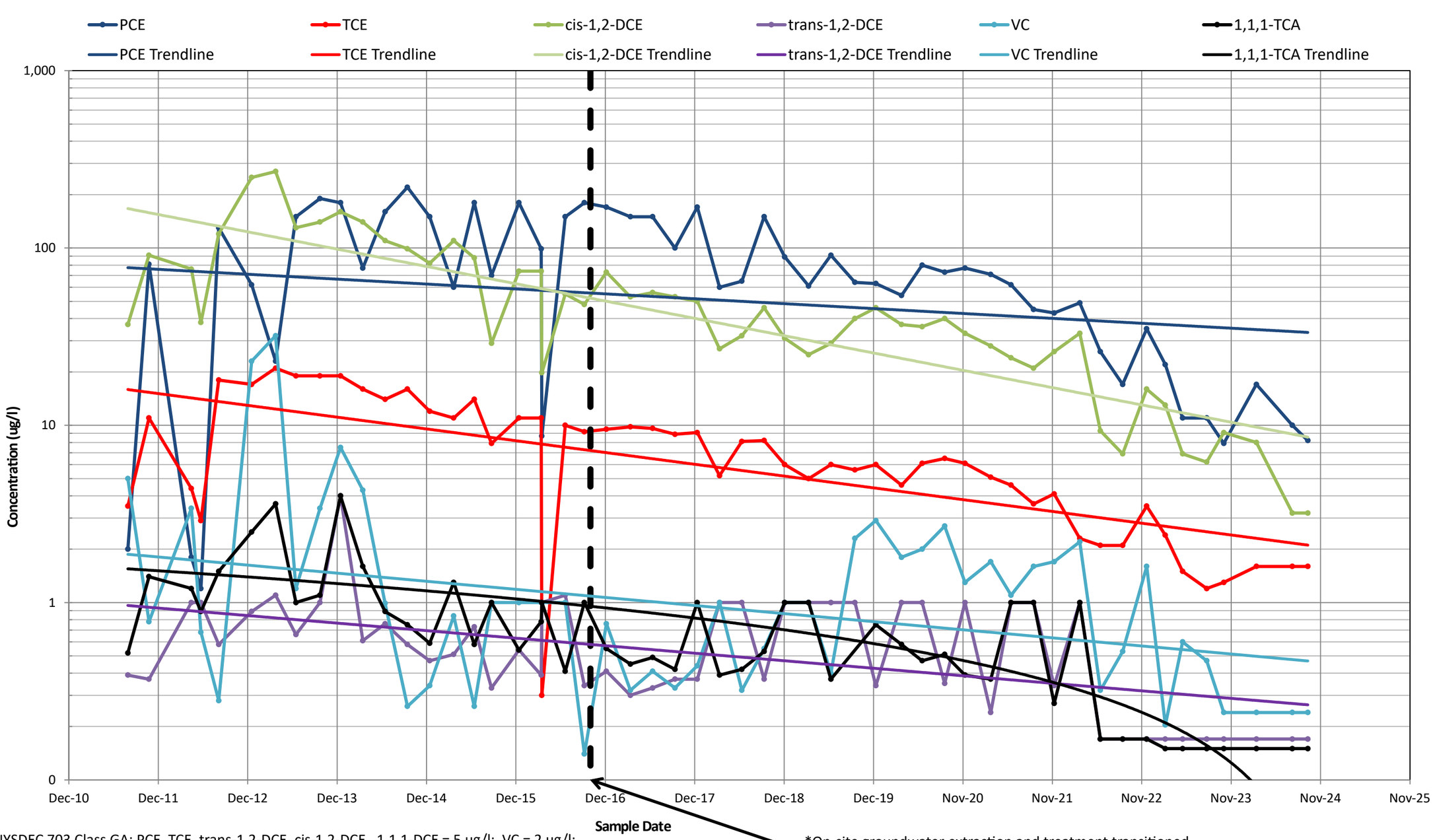
CHLORINATED VOC CONCENTRATIONS
BP-3B

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 23

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

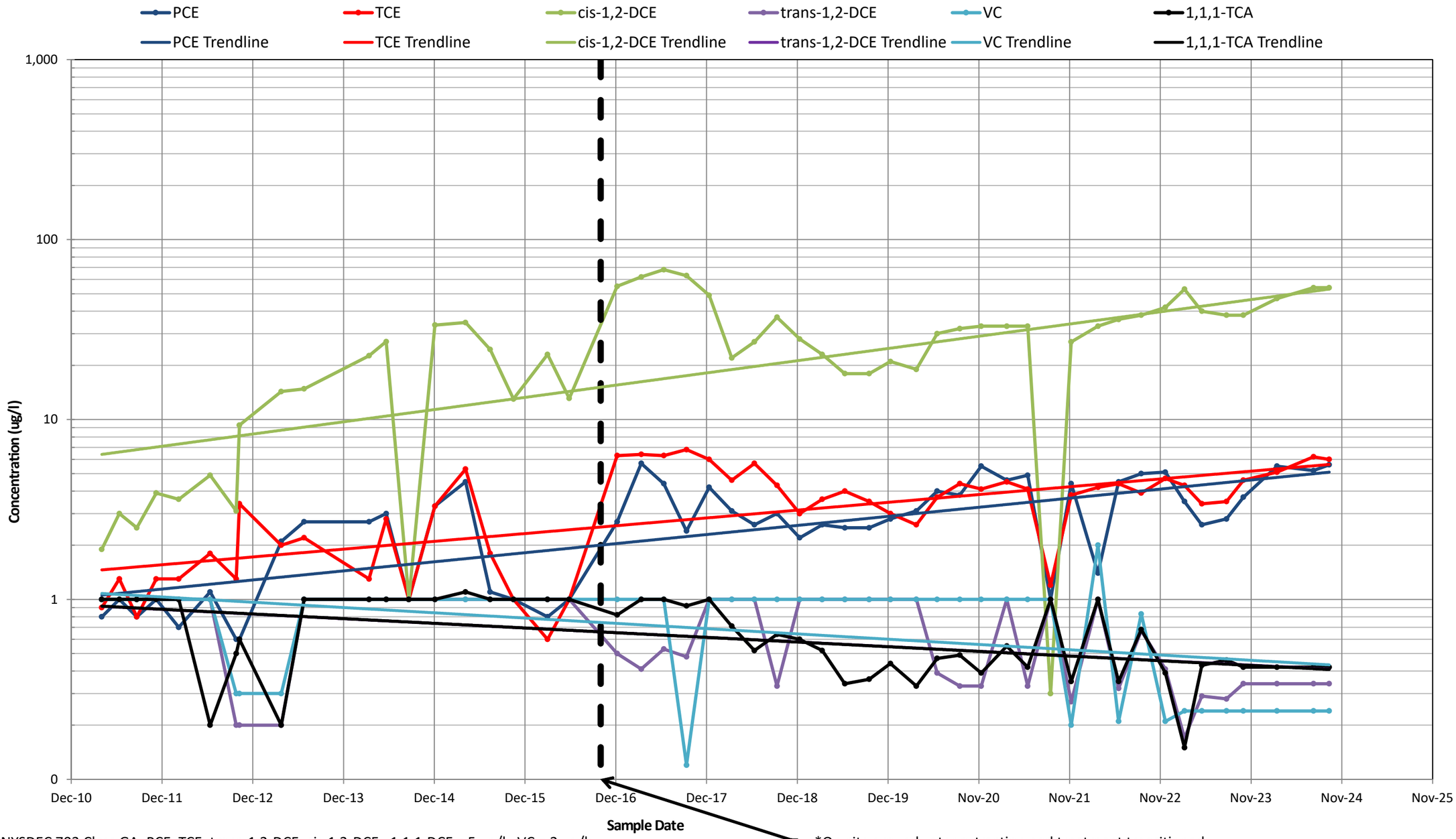
CHLORINATED VOC CONCENTRATIONS
BP-3C

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 24

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



NYSDEC 703 Class GA: PCE, TCE, trans-1,2-DCE, cis-1,2-DCE , 1,1,1-DCE = 5 ug/l; VC = 2 ug/l;
Detection limits used to display non-detect results. How some reporting limits were generated is unknown.

*On-site groundwater extraction and treatment transitioned from the OU4 treatment facility to the OU5 treatment facility as of October 1, 2016.

CHLORINATED VOC CONCENTRATIONS
MW-11A

CLAREMONT POLYCHEMICAL CORPORATION
505 WINDING ROAD
OLD BETHPAGE, NEW YORK

FIGURE 25

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL