

**THIRD FIVE-YEAR REVIEW REPORT
RODALE MANUFACTURING SUPERFUND SITE
LEHIGH COUNTY, PENNSYLVANIA**



Prepared by

**U.S. Environmental Protection Agency
Region III
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A handwritten signature in blue ink, which appears to read "Karen Melvin", is positioned above a horizontal dashed line.

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SEP 19 2018

Date

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LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order of Consent
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIP	Community Involvement Plan
DNAPL	Dense Non-Aqueous Phase Liquid
EC	Environmental Concern
EPA	United States Environmental Protection Agency
EXW	Extraction Well
GCS	Groundwater Cleanup Standard
GMP	Groundwater Monitoring Plan
GWTS	Groundwater Treatment System
hp	horsepower
FYR	Five-Year Review
IC	Institutional Control
LPGAC	Liquid Phase Granular Activated Carbon
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter
MNA	Monitored Natural Attenuation
MW	Monitoring Well
MPR	Monthly Progress Report
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OMM	Operation, Maintenance and Monitoring
ORP	Oxidation-Reduction Potential
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PCE	Perchloroethene also known as Tetrachloroethene
PCOR	Preliminary Close Out Report
PRAP	Proposed Remedial Action Plan
QA	Quality Assurance
RA	Remedial Action
RAO	Remedial Action Objectives
RD	Remedial Design
RD/RA	Remedial Design / Remedial Action
RI/FS	Remedial Investigation / Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SI	Site Inspection
SVOC	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TI	Technical Impracticability

LIST OF ABBREVIATIONS & ACRONYMS (cont'd)

TOC	Total Organic Carbon
µg/L	Micrograms per Liter
EPA	United States Environmental Protection Agency
UU/UE	Unlimited Use and Unrestricted Exposure
VI	Vapor Intrusion
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulation [CFR] Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the third FYR for the Rodale Manufacturing Superfund Site (the Site). The triggering action for this statutory review is the signature date of the second FYR, September 30, 2013. The FYR has been prepared because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one operable unit (OU1) that will be evaluated in this FYR, which addresses groundwater contamination.

The Site FYR was led by José Redmond Girón, EPA Remedial Project Manager (RPM). Other participants included:

Mark Leipert – Hydrogeologist, EPA

Amanda Miles – Community Involvement Coordinator (CIC), EPA

Ron Schock – Licensed Professional Geologist, Pennsylvania Department of Environmental Protection (PADEP)

Schneider Electric USA, Inc. (Schneider Electric, property owner) was notified of the initiation of the FYR which began on February 1, 2018.

Site Description and Background

The Site property comprises an approximately 1.2-acre parcel located at the intersection of South 6th and Minor Streets in the Borough of Emmaus, Lehigh County, Pennsylvania, about five miles south of the City of Allentown (Figures 1 and 2). Currently, the only structure on the Site is a groundwater treatment system (GWTS) building, and recovery well protective enclosures. Land use in the area surrounding the Site includes residential as well as mixed industrial and commercial facilities.

The Site had been used for commercial or manufacturing purposes since at least the 1920s. Various businesses operated at the Site until 1986 when manufacturing operations ceased. Previously used waste disposal wells were encountered during demolition; however, historical waste disposal via wells was first identified in 1981 when one of three waste disposal wells were discovered during Site improvement activities. Contaminants identified within the waste disposal wells included various VOCs, metals, and cyanide. An interim groundwater pump and treat system (air stripping) operated between 1984 and 1989 that extracted groundwater from one extraction well (Well 1).

In January 1989, a Site Inspection (SI) was conducted by EPA at the Site. The SI included the collection of water samples from the three former on-Site disposal wells, four on-Site monitoring wells, three of the six Borough of Emmaus water supply wells, and three residential wells. In November 1989, PADEP collected

several water samples from wells located downgradient of the study area, including one Borough of Emmaus water supply well and five downgradient private wells in Lower Macungie Township. A hydrogeologic investigation was completed during 1989 as well. Groundwater data indicated VOCs (predominantly TCE), semi-volatile organic compounds (SVOCs), metals, and cyanide at concentrations above regulatory guidance values and standards. The off-Site sampling by PADEP revealed TCE in three of the wells, with two of the detections being above the federal and state drinking water MCLs and the Commonwealth of Pennsylvania Human Health Standard for groundwater. The 1989 hydrogeologic investigation identified an apparent primary set of bedrock fractures trending approximately east-west, and a secondary set of fractures trending approximately north-south in the vicinity of the Site. It also identified low concentrations of VOCs in five Borough of Emmaus supply wells located hydraulically upgradient and cross-gradient from the Site suggesting that additional sources of dissolved-phase TCE exist in the Borough. On July 21, 1991, the Site was proposed for placement on the National Priorities List (NPL) and subsequently was listed on October 4, 1991.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Rodale Manufacturing Superfund Site		
USEPA ID: PAD981033285		
Region: 3	State: PA	City/County: Emmaus Borough / Lehigh County
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the Site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA <i>[If "Other Federal Agency", enter Agency name]:</i>		
Author name (Federal or State Project Manager): Josè R Redmond Girón		
Author affiliation: EPA – Region III		
Review period: 9/30/2013 - 9/30/2018		
Date of Site inspection: 8/16/2018		
Type of review: Statutory		
Review number: 3		
Triggering action date: 9/30/2013		
Due date (five years after triggering action date): 9/30/2018		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

An Administrative Order of Consent (AOC) to conduct the Remedial Investigation and Feasibility Study (RI/FS) was executed between EPA and the potentially responsible party (PRP) at the time, Square D, and became effective on September 21, 1992. As part of that Order, Square D conducted a Well Survey Investigation of the wells in the Borough of Emmaus and adjacent areas to evaluate the extent of contamination. The RI and Well Survey Investigation activities included ambient air sampling, soil sampling, groundwater sampling both on and off the Rodale Manufacturing property, hydrogeologic mapping, pump tests, and installation of eight monitoring cluster wells beyond the boundary of the Rodale Manufacturing property. Sampling results from this investigation revealed that contamination from the Site had migrated off Site and that low levels of contamination were detected in some private wells. In addition to these activities, the RI included data collection to evaluate the presence of DNAPLs at the Site, an evaluation of the potential for natural attenuation processes to effectively treat the dissolved-phase portion of the contaminant plume, and an evaluation of the technical impracticability (TI) of achieving ARARs with regard to restoration of groundwater within a reasonable time frame given the circumstances at the Site.

The results of the Well Survey Investigation were included in a September 1994 report. Based on the findings of the Well Survey Investigation, a separate AOC for a Removal Response Action was executed in 1994. The 1994 AOC required the installation and operation of a GWTS to recover and treat contaminated groundwater to limit further migration of the contamination. The construction of the GWTS was completed in August 1996 and utilized four existing on-Site wells (Well 3, Well 4, RW-3, and MW-4) as extraction points and, with modifications, has been operational 24 hours a day, unattended under automatic conditions since 1996, except for occasional maintenance shutdowns.

RI activities were conducted between 1996 and 1999, concurrently with the construction of the GWTS. The RI Report was submitted in March 1998 and the FS in 1999. Two types of significant contamination were identified at the Site:

- Groundwater contamination by chlorinated and non-chlorinated VOCs; and
- Subsurface soil contamination by various organic compounds including volatile, semi-volatile, and pesticide/polychlorinated biphenyl (PCB) compounds, and to a lesser degree, heavy metals.

Groundwater contamination is present in two areas of the Site, the Probable DNAPL Area which is located within the Rodale Manufacturing property and the downgradient dissolved-phase plume, which is located primarily off of the Rodale Manufacturing property.

During the RI/FS, a risk assessment was performed to determine the level of risk from contaminants in on-Site soils and groundwater and off-Site groundwater based on individual Site-specific scenarios. The risk assessment found that there are unacceptable risks for potential future adult and child residents from on-Site groundwater utilized for potable use. The assessment also found that there were unacceptable risks posed by subsurface soils below 15 feet to future on-Site adult and child residents.

Response Actions

On September 30, 1999, EPA issued a ROD documenting the Selected Remedy for the Site that included the following components:

- Operation of a GWTS to provide hydraulic containment of contaminated groundwater in the Probable DNAPL Zone;

- TI Waiver for groundwater cleanup levels in the Probable DNAPL Zone;
- Monitored natural attenuation (MNA) for the downgradient dissolved-phase plume outside the GWTS capture zone to achieve groundwater cleanup levels (Table 1);
- Institutional controls (ICs), in the form of land use restrictions in the property boundaries to prevent or reduce exposure to contaminated soils, and groundwater-use restrictions throughout the entire Site to prevent or reduce exposure to contaminated groundwater.

The TI Waiver in the ROD applied to the following Applicable or Relevant and Appropriate Requirements (ARARs) for:

- The Maximum Contaminant Level (MCL) for trichloroethene (TCE) inside the Probable DNAPL Zone (TI Waiver Area); and the soil standards established pursuant to Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2), Section 303 (25 PA Code § 250.305 (b) and Appendix A, Table 3b) for TCE and Perchloroethene (PCE, also known as tetrachloroethene) in subsurface soil below 15 feet.

Table 1: Ground Water Cleanup Levels and Basis

Chemical	Cleanup Level in Micrograms/Liter (µg/l)	Basis
Chloroform	0.15	RBC
1,1-Dichloroethene	4	RBC
Carbon Tetrachloride	0.16	RBC
Perchloroethene	1.1	RBC
Trichloroethene	1.6	RBC
1,1,2-Trichloroethane	0.19	RBC
Chloromethane	2	RBC
Vinyl Chloride	0.019	RBC
1,4-Dichlorobenzene	0.47	RBC
Bis(2-ethylhexyl)phthalate	4.8	RBC
Pentachlorophenol	0.56	RBC
Arsenic	0.045	RBC
Ammonia	200	Federal MCL
Antimony	6	RBC
Copper	150	RBC
Iron	300	PA Act 2 (SMCL)
Thallium	0.5	MCLG
Lead	5	PA Act 2 (SMCL)
Chromium	100	Federal MCL
Benzene	0.4	RBC
Benzo[k]fluoranthene	0.55	PA Act 2 (s)
Dibenzo[a,h]anthracene	0.0092	RBC
Benzo[b]fluoranthene	0.0092	RBC
N-nitrosodiphenylamine	14	RBC
Phenanthrene	110	RBC
Ethylbenzene	700	Federal MCL
2-methylnaphthalene	120	RBC

Chemical	Cleanup Level in Micrograms/Liter (µg/l)	Basis
Benzo[a]anthracene	0.0092	RBC
Barium	2,000	Federal MCL
Cadmium	5	Federal MCL
Cyanide	200	Federal MCL
Nickel	100	PA Act 2 (H)
Vanadium	2.1	PA Act 2 (G)
Zinc	2,000	PA Act 2 (H)
Aluminum	200	PA Act 2 SMCL)
Indeno[1,2,3-cd]pyrene	0.092	RBC
Naphthalene	6.5	RBC
Pyrene	13	PA Act 2 (S)
Xylenes, total	4,000	Federal MCL
Benzo[a]pyrene	0.0092	RBC
Di-n-octyl phthalate	730	RBC
Manganese	50	PA Act 2 (SMCL)
cis 1,2-dichloroethene	40	RBC
trans 1,2-dichloroethene	50	RBC
4-methylphenol	60	RBC
Toluene	380	RBC

RBC Risk-based concentration
MCL Maximum Contaminant Level
MCLG Maximum Contaminant Level Goal
SMCL Secondary Maximum Contaminant Level Goal
H Lifetime Health Advisory Level
G Ingestion
s Aqueous Solubility Cap

Status of Implementation

As indicated above, the GWTS required by the ROD was constructed as a removal action in 1996. In September 2014, the current PRP, Schneider Electric, completed a modification of the GWTS to replace the former air-stripping technology with a closed-loop liquid phase granular activated carbon (LPGAC)-based system that eliminates the point source air emissions associated with the former GWTS, with the exception of one vapor-phase GAC canister that acts as a passive vent to control any VOC emissions in the headspace of the 5,000-gallon pretreatment equalization tank. EPA approved the GWTS modification along with the Remedial Design/Remedial Action (RD/RA) Completion Report Addendum (dated October 8, 2014) by letter dated January 8, 2016.

Extraction Wells EXW-1, EXW-2, EXW-3R, and EXW-4 currently provide hydraulic control to the on-Site and proximal off-Site groundwater. In 2016, the PRP installed nine additional monitoring wells (MW-14S/14D, MW-15S/15D, MW-16S/16I/16D, and MW-17S/17D) and replaced monitoring well MW-7S with MW-7SR and well MW-8D with MW-8DR.

MNA monitoring is performed on an annual basis in accordance with the 2004 Long-Term Groundwater Monitoring Plan (GMP). Groundwater sampling data are collected and used to establish the concentration of Site contaminants and key water quality parameters. The resulting laboratory data are compiled into time series trend plots and statistical evaluations to identify and assess contaminant trends over time, both inside and

outside the Probable DNAPL Zone. MNA parameter laboratory results as well as groundwater quality results have been summarized and evaluated in each Annual Groundwater Monitoring Report and the conclusions are that natural attenuation is occurring at the Site.

A vapor intrusion (VI) investigation was performed between 2010 and 2012 and concluded that VI is not an exposure risk at the Site. However, the VI investigation discovered that emissions from the GWTS resulted in elevated concentrations of Site COCs in ambient air in the vicinity of the Site, resulting in the modifications to the GWTS described above and in Section III of this FYR.

Institutional Controls

ICs are non-engineered controls implemented to protect a remedy and to minimize human exposure to contamination at a Superfund site. The measures may include, but not be limited to, legal and administrative controls such as zoning, limitation or prohibition of water resources, and/or restriction of land use. The ICs required by the ROD are as follows:

- Restriction of future land use, in any matter that may interfere with the remedy;
- Restriction of future land use, that may start or expand any pumping at the Site;
- Prohibition of water use for human consumption;
- Prohibition of new development not to affect the hydraulic containment and plume migration;
- Requirement of identification of the Site as being underlain by contaminated groundwater; and
- Use of EPA-approved means such as easements, restrictive covenants, and/or local governmental controls to attain the above restrictions.

The ICs were implemented in 2013 in the form of an environmental covenant for the Site, a copy of which is included in Appendix C. Schneider Electric recorded an easement for the Site property to allow EPA access and to enforce any land/water restriction or any other restriction that EPA determines is necessary to protect the remedy.

The Schneider Electric easement did not address pumping of existing wells, installation and pumping of new wells, or human consumption of contaminated groundwater, outside of the property owned by Schneider Electric. This IC is implemented through the Emmaus Borough Water Department regulations that requires all owners of property in the Borough abutting any street or alley, in which there is a water main or in which a water main may be constructed to make connection at their own expense. EPA reviewed the configuration of the water distributing system and confirmed that all the streets in the vicinity of the down gradient contaminated ground water plume have water mains running under them. Also, the water department was not aware of any private wells being used for consumptive, or non-consumptive purposes in that area of the Borough. The Public Works Director stated that the intent of the water regulations was to have all new construction in the Borough connect to the system.

Table 2: Summary of Planned and/or Implemented ICs

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs Needed	ICs Called for in the Decision Document	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater Soil	Yes	Yes	Lehigh County, PA Parcel #549454705669	Prohibit use of contaminated groundwater for potable use until groundwater cleanup levels are achieved.	Environmental Covenant recorded on September 18, 2013 in accordance with Commonwealth of Pennsylvania Uniform Environmental Covenant Act
Groundwater	Yes	Yes	Groundwater contaminant plume	Prohibit use of contaminated groundwater for potable use until groundwater cleanup levels are achieved.	Emmaus Borough Water Department regulations

Operation & Maintenance

Monthly Progress Reports (MPRs) were submitted to EPA addressing the period between January 2013 and December 2017. According to information in the available MPRs, the PRP performed weekly routine preventative maintenance and sampling between January 2013 and December 2017 according to the Operation, Maintenance and Monitoring Plan (OMM), which typically consisted of:

- Perimeter walk.
- Changing sediment (bag) filters and cleaning sediment filter canisters (as needed).
- General pumps and blower maintenance (belt tensioning, greasing).
- Transfer pump flow adjustment (as needed).
- Verification of gauges and fluid levels.
- GAC changeouts (as needed).
- Collection of influent, midfluent (as needed), and effluent water samples.

Influent water sample analytical results were used to calculate contaminant mass removal based on contaminant concentration, flow rate, and volume, and midfluent sample analytical results were used to determine the need for periodic LPGAC replacement. Effluent water samples were analyzed for compliance with PADEP Daily Maximum and Monthly Average effluent limits that were taken from the established discharge requirements found in Table 17 of the 1999 ROD.

Non-routine or notable OMM activities between January 2013 and December 2017 are summarized as follows:

- September 9 through 30, 2013 – GWTS shut down for replacement of 3-horsepower (hp) equalization tank discharge pumps with 5-hp air-stripper discharge pumps, installation of a flow meter, installation of vapor-phase GAC, LPGAC changeouts, and programmable logic control and piping modifications to bypass air stripper. Testing and startup of the modified GWTS occurred on September 30, 2013.

- August 4, 2014 – Extraction Well EXW-3 was redeveloped and a new pump, new motor, and a new transducer were installed.
- September 2014 – Final modification to GWTS to add two 5,000-pound LPGAC units to existing four LPGAC units completed / system startup.
- August through November 2016 – Extraction Well EXW-3 offline pending replacement. Installation of replacement well EXW-3R completed September 7, 2016.
- May 10, 2017 – Reconnection of EXW-3R to GWTS complete and EXW-3R placed online.
- August 2017 – A request was made on August 8, 2017 to PADEP to reduce the effluent sampling and analysis frequency of total and dissolved iron from monthly to quarterly. PADEP granted a reduction in sampling and analysis frequency as requested in a letter dated August 21, 2017.

As of December 2017, based on the December 2017 MPR, the GWTS has removed approximately 29,061 pounds (13,182 kilograms) of TCE and approximately 234,133,169 gallons of water since its start of operation in 1997.

Annual groundwater samples were collected from wells inside the Probable DNAPL Zone (MW-1, MW-4, and Well 6) and outside of the Probable DNAPL Zone (off-Site monitoring wells) between 2013 and 2017. These monitoring wells were also gauged semiannually to confirm capture zone limits. Notable activities between January 2013 and December 2017 with respect to the monitoring wells are summarized as follows:

- August 4 through 8, 2014 – Redevelopment of Monitoring Wells MW-4, MW-5S, MW-8S, and MW-11S due to high turbidity.
- July 25 through October 12, 2016 – Addition of off-Site Monitoring Wells MW-14S, MW-14D, MW-15S, MW-15D, MW-16S, MW-16I, MW-16D, MW-17S, and MW-17D (Figure 2). Redevelopment of Monitoring Wells MW-5S, MW-5D, and Well 6 due to sediment accumulation.
- September 22, 2016 – Monitoring Well MW-8D abandoned and replaced with Monitoring Well MW-8DR on October 6, 2016.
- September 26, 2016 – Monitoring Well MW-7S abandoned and replaced with Monitoring Well MW-7SR on October 4, 2016.
- January 2017 – Supplemental groundwater samples collected from select wells including those that were installed during 2016.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR as well as the recommendations from the previous FYR and the current status of those recommendations. The protectiveness statement from the 2013 FYR is as follows:

Table 3: Protectiveness Determinations/Statements from the 2013 FYR

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide	Will be Protective	The remedy being implemented at the Rodale Manufacturing Site currently protects human health and the environment in the short term because the GWTS as modified by the approved (August 20, 2013) pilot work plan is expected to effectively maintain hydraulic control of the probable DNAPL zone and treat the extracted groundwater via liquid phase carbon and attain all required treated groundwater discharge performance standards while eliminating off-gas from the system. The remedy will be protective in the long term if the pilot is deemed successful, or when if necessary, alternative appropriate modifications to the treatment system are made to ensure that the treatment system is effective at meeting all performance standards. MNA is effectively reducing the dissolved contaminant plume outside the probable DNAPL zone as evidenced in the lower concentrations of contaminants at downgradient wells, however, sampling will continue and MNA will be evaluated again in the next five-year review.

The 2013 FYR report identified one issue and recommended follow-up actions. It was recommended that the effectiveness of the modified GWTS be evaluated, as the PADRE/Thermatrix off-gas treatment system was not operating as designed. The following is a summary of the actions taken to address the recommendations made in the 2013 FYR.

Table 4: Status of Recommendations from the 2013 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	PADRE/Thermatrix off-gas treatment system not functioning as designed.	Evaluate the effectiveness of modified groundwater treatment system pilot and proceed accordingly.	Completed	GWTS modified to replace the former air-stripping technology with a closed-loop LPGAC-based system.	September 2014

Schneider Electric completed a modification of the GWTS to replace the former air-stripping technology with a closed-loop LPGAC-based system. EPA approved the GWTS modification along with the RD/RA Completion Report Addendum (dated October 8, 2014) by letter dated January 8, 2016.

Based on the findings of a VI investigation performed in 2012, EPA determined that the original GWTS did not function as designed between 2008 and 2013, resulting in uncontrolled emissions of air pollutants. On May 3, 2016, EPA announced that Schneider Electric agreed to pay a fine for allegedly violating the terms of the 2002 Consent Decree that stipulated the GWTS operation. The source of emissions was eliminated when Schneider Electric installed the closed-loop system in lieu of the air stripper, as discussed above. The fine has been paid by Schneider Electric and the enforcement action is considered closed.

In November 2015, as a result of the completed modification of the GWTS, EPA requested Schneider Electric to collect a follow-up confirmatory round of ambient air samples to compare current conditions to the 2012 ambient air sampling results that were collected as part of the VI investigation for the Site. Schneider Electric

completed the confirmatory ambient air sampling program in June 2016 and submitted a Confirmatory Ambient Air Monitoring Report to EPA on September 22, 2016, followed by a revised Confirmatory Ambient Air Monitoring Report on December 22, 2016. Carbon tetrachloride, methylene chloride, and TCE were detected in one or more ambient air samples from the area surrounding the Site. Based on the analytical and meteorological data collected from the Site and surrounding residential properties in 2016, and a comparison of the 2016 data to previous data collected in 2012, the 2016 Confirmatory Ambient Air Sampling Program concluded that ambient air at the neighboring residential properties is not being impacted by current activities at the Site.

With respect to TCE, the primary COC at the Site, the 2016 ambient air results demonstrated that TCE concentrations in ambient air were lower in the 2016 sampling round than those measured in the 2012 sampling round, were consistent throughout the neighborhood, and did not vary based on proximity to the Site or position relative to wind patterns. The Confirmatory Ambient Air Monitoring Report concluded that the assessment of the ambient air exposure pathway was complete and that no further investigation was warranted. A meeting was held with EPA, PADEP, and Schneider Electric representatives on March 8, 2017 to discuss the 2016 annual groundwater results and the results of the Confirmatory Ambient Air Monitoring Report. At that time, the agencies agreed that no further investigation of ambient air was necessary.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was published in the Times News (Lehigh Valley) on Wednesday July 11, 2018, stating that the FYR was underway and inviting the public to submit any comments to EPA. The results of the FYR and the report will be made available at the Site's information repository, located at the Emmaus Public Library, 11 E Main Street, Emmaus, Pennsylvania, and online at <https://www.epa.gov/superfund/rodale>.

On August 16, 2018, EPA CIC Amanda Miles and RPM Jose Redmond participated in a site visit along with PADEP and PRP representatives. The meeting included an overview of the remedy and O&M to ensure it is functioning as intended. Representatives interviewed expressed satisfaction with EPA's work and communication regarding the Site. There were no community concerns expressed.

As a part of the review, the EPA CIC and RPM met with an official of Emmaus Borough to provide an overview of the Site and community updates. Emmaus Borough Officials reported being well-informed about the Site and have no concerns or complaints. They rarely receive inquiries from residents, but feel well prepared to address them if they do arise. For future information dissemination needs, the Borough offered their resources to help inform the public, such as newsletters, the borough website, and the borough notification system.

Data Review

GWTS Operational Data

GWTS influent and effluent samples have been collected routinely since system became operational and functional. For the period of time covered by this review, these samples were collected monthly and compared against the substantive requirements of the PADEP National Pollutant Discharge Elimination System (NPDES) permit.

Capture zone analyses are performed after each semiannual groundwater gauging event to ensure that contamination existing inside the Probable DNAPL Zone (also known as the TI Waiver Area) continues to be effectively captured by the operation of the GWTS. Separate capture zone analyses are performed for both the shallow bedrock aquifer (i.e., 0 to 199 feet below ground surface [bgs]) and deep bedrock aquifer (i.e., 200 feet

bgs and deeper) inside and outside the Probable DNAPL Zone. By its nature, the capture zone analysis focuses on groundwater elevation and flow data inside and outside the Probable DNAPL Zone only, without regard to contaminant concentrations in those wells.

Capture zone analyses conducted between 2013 and 2018 indicate that the GWTS is maintaining the capture zone as directed by the ROD, and that the Probable DNAPL Zone is located entirely within the limits of the shallow and deep groundwater capture zones. Groundwater potentiometric maps for the shallow and deep bedrock aquifers for the June 2017 groundwater gauging event are presented on Figures 3 and 4, respectively, while the shallow and deep maps for the November 2017 event are presented on Figures 5 and 6, respectively.

Based on the review of potentiometric maps for the shallow bedrock aquifer, groundwater capture extends from the property southeast and southwest toward Monitoring Wells MW-6 and MW-8S, respectively, and it also extends to the northwest almost to the location of Monitoring Well MW-16S. Based on the measured water levels, groundwater capture was similar during the two gauging events in 2017 and is comparable with previous events.

Based on the review of potentiometric maps for the deep bedrock aquifer, the footprint of the groundwater depression caused by groundwater extraction is similar to capture zones analyzed in previous years. Deep Monitoring Well MW-16D is located near the downgradient stagnation point of the deep groundwater capture zone. This capture zone configuration may relate to preferred groundwater migration routes in the deep bedrock aquifer due to the presence of fractures. The Probable DNAPL Zone is located entirely within the limits of the shallow and deep groundwater capture zones as depicted on Figures 7 and 8, respectively.

Historical water level measurements collected between 2013 and 2017, as exemplified in the November 2017 data, demonstrate that the GWTS continues to meet the first component of the Selected Remedy specified in the ROD: “hydraulic containment of the dissolved-phase VOC plume at and in the immediate vicinity of the probable DNAPL zone by extraction and treatment of groundwater”.

Groundwater Analytical Data

Groundwater samples were collected annually during this FYR period to evaluate remedy performance. The groundwater monitoring program for this FYR period was conducted from 2013 to 2017 in accordance with the 2004 EPA-approved GMP. The implementation of the GMP ensures that the Selected Remedy for the Site – a combination of hydraulic containment and MNA – continues to be effective. In addition, Schneider Electric voluntarily conducted a supplemental groundwater sampling event in January 2017 that included collecting groundwater samples from select wells including those that were installed during 2016. The purpose of this supplemental sampling event was to obtain additional characterization data from the selected areas of the Site for general evaluation purposes.

Monitoring wells were purged and sampled in accordance with the EPA-approved Rodale Manufacturing Site Sampling Analysis Plan (SAP) (BB&L, 2002). Appropriate quality assurance (QA) samples, including trip blanks, duplicates, and equipment rinsate blanks, were also collected and analyzed in accordance with the SAP. The groundwater generated during the well purging activities was containerized and discharged to the GWTS for treatment and disposal. The groundwater samples were analyzed for the following laboratory parameters in accordance with the 2004 GMP: Target Compound List (TCL) VOCs, and Target Analyte List (TAL) total and dissolved metals (arsenic, lead, and manganese). MNA laboratory parameters were also collected and analyzed including: nitrate, ferrous iron (total and dissolved), sulfate, methane, ethane, ethene, alkalinity, chloride, carbon dioxide, and TOC as well as field parameters including: dissolved oxygen, ORP, pH, temperature, and specific conductivity.

Table 6 (Appendix D) provides a summary of groundwater analytical results from 2012 to 2017 for Monitoring Wells EXW-1, EXW-2, EXW-3R, EXW-4, MW-1, MW-4, and Well 6 (located inside the Probable DNAPL Zone). Graphs showing time series trends for these wells using their reported TCE concentrations are included following Table 6.

Table 7 (Appendix D) provides a summary of groundwater analytical results from 2012 to 2017 for the monitoring wells outside of the Probable DNAPL Zone. Graphs showing time series trends for select wells using their reported TCE concentrations are included following Table 7.

Mann-Kendall statistical trend analyses were performed to determine if increasing or decreasing trends were present and the significance of the observed trend at the 95 percent confidence level. Mann-Kendall statistical trend output documentation as of 2017 is provided in Table 8 (Appendix D) for monitoring wells located inside and outside of the Probable DNAPL Zone where associated samples exceeded the cleanup levels for VOCs.

In 2016, based on an evaluation of the three previous years of annual groundwater monitoring results, an increasing concentration trend was observed in groundwater Monitoring Wells MW-10I and MW-13I which are located outside the hydraulic containment area of the GWTS. The increasing trend raised concerns regarding the nature and efficacy of MNA to treat VOCs in areas that are outside the hydraulic containment area of the GWTS. The resulting evaluation concluded that the VOC concentrations observed in Monitoring Wells MW-10I and MW-13I as well as concentrations at Monitoring Wells MW-14D and MW-15D are from an off-site source based on the groundwater flow direction that demonstrates that these wells are located hydraulically upgradient of the Site. The VOC signatures of the groundwater show the presence of carbon tetrachloride in these wells but absent in wells located inside the Probable DNAPL Zone. Therefore, the presence of the off-Site source affects these monitoring wells such that, they can no longer be used to form conclusions about the MNA portion of the remedy.

This conclusion is consistent with previous observations made in the 1998 RI Report regarding an off-Site source to the west-northwest of the Site that stated that VOC concentrations observed at Wells MW-9S/9D were not Site-related. Additional investigation of the potential off-Site source is warranted. Contaminant concentration distribution is shown on Figure 9 for the monitoring wells inside the Probable DNAPL Zone and on Figure 10 for the off-Site wells located outside the Probable DNAPL Zone.

MNA Groundwater Data

Groundwater samples were collected from the wells inside and outside the Probable DNAPL Zone during this FYR period. The parameters monitored annually as part of the MNA program include: field measurements of dissolved oxygen, ORP, pH, temperature, specific conductivity and laboratory analysis of nitrate, ferrous iron (total and dissolved), sulfate, dissolved gases (methane, ethene, ethane), alkalinity, chloride, carbon dioxide and TOC.

A summary of the MNA parameter laboratory results are presented in Tables 5 and 6 (Appendix D) for wells located inside the Probable DNAPL Zone and outside the Probable DNAPL Zone, respectively.

In 2016, Schneider Electric conducted a detailed review of historical (2002 through 2015) groundwater data including MNA parameters. This evaluation concluded that natural attenuation is occurring; however, the degree and rate of natural attenuation downgradient of the property is not well defined. As a result, the PRP developed and initiated an iterative approach to better evaluate natural attenuation processes both inside and outside of the Probable DNAPL Zone. The results of the 2016 evaluation were presented in the April 2017 Natural Attenuation Evaluation Report and indicated that favorable conditions for biological natural attenuation exist both inside and outside the Probable DNAPL Zone. The general chemistry parameters support groundwater conditions consistent with and favorable for oxidative biological degradation via aerobic co-

metabolic processes rather than the reductive biological natural attenuation processes previously reported at the Site.

The Addendum to the 2017 Natural Attenuation Evaluation Report further concluded that MNA processes via reductive dechlorination are limited in the area immediately northwest of the Site and are suppressed farther to the northwest, and at some locations may not be occurring at all. The suppression of MNA processes northwest of the Site is due in part to the presence of an off-Site VOC source, as evidenced by groundwater flow directions and the presence of carbon tetrachloride. Therefore, the presence of the off-Site source affects the monitoring wells to the north-northwest of the Site such that, they can no longer be used to form conclusions about the MNA portion of the remedy. Additional investigation of the potential off-Site source is warranted.

Site Inspection

The inspection of the Site was conducted on August 16, 2018. In attendance were RPM José R. Redmond and Amanda Miles CIC for the Site from EPA. Ronald Schock Project Officer for PADEP; Matt Valentine, Project Manager for the Site and Matthew Smith from Woodard and Carrant, contractors for Schneider Electric. The purpose of the inspection was to assess the protectiveness of the remedy.

The Site inspection consisted of a walkthrough of the exterior of the facility, inspection of the fence and wells in the facility, observation of the interior of the GWTS, and the inspection of the well network outside of the facility. The exterior of the facility has a new fence with working locks and sufficient security. The wells within the facility boundary are in excellent condition with secure caps. Most of the excess piping from the air stripper has been removed, creating space with the new GAC system and the associated piping. In the days prior to the inspection, a significant amount of precipitation had occurred in the area; however, there were no signs of infiltration in the building housing the GWTS. Finally, wells outside the facility boundary appeared to be in working order, with secured caps and no apparent disturbances.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Yes. The GWTS is operating as intended maintaining hydraulic containment of the Probable DNAPL Zone. In the dissolved-phase plume outside the area of hydraulic containment, MNA appears to be reducing the contaminant concentrations. Continued monitoring is warranted to ensure that groundwater performance standards will be met in a reasonable time period. There is no current exposure to contaminated groundwater due to the connection of residents and businesses to the public water supply and the ICs implemented for the property and within Emmaus Borough to prevent the use of groundwater. As discussed above, the PADRE/Thermatrix System for off-gas treatment of the GWTS was determined to not be operating as designed. Schneider Electric completed a modification of the GWTS in 2014 to replace the former air-stripping technology with a closed-loop LPGAC-based system.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Yes. No other changes in the risk assessment methodology and toxicity factors call into question the protectiveness of the remedy. The RAOs used at the time of remedy selection and as documented in the ROD are still valid and appropriate. Exposure pathways as previously identified have not changed such that exposure to Site contaminants would be likely.

EPA is currently evaluating Poly- and Per-fluorinated Alkylated Substances (PFAS) as possible drinking water contaminants under the Safe Drinking Water Act. Based on the potential for historical use of PFAS at the Site, EPA has required that Schneider Electric evaluate the presence of PFAS compounds. In June 2018, Schneider Electric submitted a work plan that detailed the sampling and analysis of PFAS compounds at the Site. The PFAS sampling program will be initiated concurrent with the 2018 Annual Groundwater Monitoring Program scheduled for November 2018.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has become available that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations	
OU(s) without Issues/Recommendations Identified in the Five-Year Review:	
OU1	

Other Findings

- Based on the potential for historical use of PFAS at the Site, samples should be collected and analyzed to determine if PFAS is present in groundwater.

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i> Protective	<i>Planned Addendum Completion Date:</i> Click here to enter a date
<i>Protectiveness Statement:</i> The Selected Remedy is protective of human health and the environment. Continued operation of the GWTS will capture and recover VOCs inside and outside of the Probable DNAPL Zone. MNA is expected reduce contaminant concentrations outside the GWTS capture zone to achieve cleanup levels. Potential receptors are protected through Site ICs, nearby residents are connected to a public water supply, and no water wells are allowed in the Borough of Emmaus as codified by Borough ordinance.	

VIII. NEXT REVIEW

The next FYR report for the Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

ARCADIS of New York, Inc., 2014, “Operation, Maintenance and Monitoring Plan for the Modified Groundwater Treatment System, Rodale Manufacturing Superfund Site, Emmaus, Pennsylvania”. Revised September 3.

ARCADIS U.S., Inc., 2014, “Remedial Design/Remedial Action (RD/RA) Completion Report Addendum, Approved Groundwater Treatment System Modifications, Rodale Manufacturing Superfund Site, Emmaus, Pennsylvania”. October 8.

ARCADIS of New York, Inc., 2015, “Annual Groundwater Monitoring Report, EPA Docket No. 111-2000-0015-DC, Rodale Manufacturing Site, Emmaus, Pennsylvania”. January 20.

Blasland, Bouck and Lee (BB&L), Inc., 2004, “Long-Term Groundwater Monitoring Plan, Rodale Manufacturing Site, Emmaus, Pennsylvania”. Correspondence to EPA, February 18.

EPA, 1999, EPA Superfund Record of Decision: Rodale Manufacturing Co., Inc., EPA ID: PAD981033285. OU1, Emmaus Borough, PA. September 30.

Woodard & Curran, 2017, “Natural Attenuation Evaluation Report, Rodale Manufacturing Superfund Site, Emmaus, Pennsylvania”. April 14.

Woodard & Curran, 2018, “Addendum to the 2017 Natural Attenuation Evaluation Report, Rodale Manufacturing Superfund Site, Emmaus, Pennsylvania”. May 1

APPENDIX B – SITE CHRONOLOGY

The table below summarizes notable events in the chronology of the Rodale Manufacturing Superfund Site.

Table 5: Site Chronology	
EVENT	DATE(S)
The Site was used for commercial or manufacturing purposes including a silk mill since at least the 1920s	1920s
Rodale Press, a manufacturing and printing business, occupied portions of the building.	1930s - 1950s
The site was operated by Rodale Manufacturing to make wiring devices and electrical connectors. Pennsylvania Department of Environmental Protection (PADEP) files indicate that significant quantities of rain water and waste were discharged into a 452-foot deep borehole on site.	1950s – 1975
The Site is sold to Bell Electric, a wholly owned subsidiary of Square D, which manufactured similar electrical components.	1975
Square D discovers a capped disposal borehole during installation of new equipment. Long time employees indicate that two additional wells on-Site were used for disposal purposes.	1981
Square D commenced pumping contaminated groundwater from one of the disposal wells. Extracted groundwater is treated via an air-stripping tower. Air strippers operated until 1989.	1984
A site inspection is conducted at the Site on behalf of EPA.	January 1989
The site was proposed for listing on the National Priorities List (NPL) and subsequently listed on the NPL on October 4, 1991.	July 21, 1991
An Administrative Order of Consent (AOC) to conduct a Remedial Investigation and Feasibility Study (RI/FS) was executed between EPA and Square D.	September 21, 1992
Based on the finding of a well survey investigation under the above AOC, a separate AOC for a Removal Response Action for a groundwater treatment system (GWTS) was executed between EPA and Square D.	September 30, 1994
Construction of the GWTS is completed.	August 1996
RI/FS is conducted at the Site under the 1992 AOC and GWTS is operated.	1996-1999
EPA issues the Record of Decision (ROD) for the Site.	September 30, 1999
An AOC for Remedial Design (RD) was executed between EPA and Square D.	September 24, 2001

Table 5:Site Chronology	
EVENT	DATE(S)
A Consent Decree (CD) is entered for Remedial Design and Remedial Action (RD/RA).	March 22, 2002
RD calling for the installation of an additional extraction well, replacement of an existing extraction well, a capture zone analysis and sampling is completed.	September 30, 2002
On-Site construction of additional extraction well begins.	October 28, 2002
RA called for by RD is completed. Additional well installation is completed.	February 2003
Preliminary Close Out Report (PCOR) is signed.	September 29, 2003
RD/RA report is submitted.	November 2003
Revised Operation and Maintenance Manual (O&M Manual) is completed.	November 2007
First Five-Year Review Report is signed.	September 30, 2008
1,4-dioxane samples were collected and analyzed, per previous Five-Year Review report recommendation.	January 2009
Vapor Intrusion (VI) sampling was performed per previous Five-Year Review recommendation (two rounds).	December 2010 – February 2012
Air samples from the effluent of the GWTS exhaust collected.	November 2012
Pilot Study Work Plan received from Schneider Electric to evaluate whether Liquid Phase Carbon Treatment alone can replace air stripping, thereby eliminating exhaust treatment.	May 2013
EPA in consultation with PADEP give approval to Schneider Electric to implement the proposed pilot system modification.	August 2013
Pilot Study Work Plan implemented with 6- to 12-month evaluation period.	September 2013
Testing and startup of the modified GWTS.	September 30, 2013
Second Five-Year Review Report is signed.	September 30, 2013
Pilot Study Evaluation letter report submitted by Schneider Electric.	March 2014
EPA in consultation with PADEP approves permanent LPGAC treatment system modifications.	June 2014
Final modification to GWTS to add two 5,000-pound LPGAC units to existing four LPGAC units completed. System startup.	September 2014
RD/RA Completion Report Addendum and revised OMM Plan submitted by Schneider Electric.	October 2014

Table 5:Site Chronology	
EVENT	DATE(S)
Supervising contractor for the site was changed from ARCADIS to Woodard & Curran.	August 2015
Acceptance of RD/RA Completion Report by EPA.	January 15, 2016
Submittal of Confirmatory Ambient Air Monitoring Report by Schneider Electric	September 22, 2016
Addition of off-Site Monitoring Wells MW-14S, MW-14D, MW-15S, MW-15D, MW-16S, MW-16I, MW-16D, MW-17S, and MW-17D. Replacement wells MW-7SR and MW-8DR installed.	July – October 2016
Submittal of Revised Confirmatory Ambient Air Monitoring Report by Schneider Electric	December 22, 2016
Schneider Electric voluntarily conducts supplemental groundwater sampling from select wells including those that were installed during 2016.	January 2017
Natural Attenuation Evaluation Report submitted to EPA by Schneider Electric.	April 2017
Reconnection of EXW-3R to GWTS complete and EXW-3R placed online.	May 10, 2017
Schneider Electric initiates field work related to the In-Situ Microcosm (ISM) studies conducted as a continuation of the NA Evaluation.	July 20, 2017
PADEP grants a request for reduction of effluent sampling and analysis frequency for total and dissolved iron from monthly to quarterly.	August 21, 2017
Schneider Electric submits an Addendum to the NA Evaluation Report including a summary of the ISM Findings.	May 2018
Schneider Electric submits a Sampling and Analysis Plan for conducting an evaluation of PFAS compounds at the Site	June 2018

APPENDIX C – ENVIRONMENTAL COVENANT

LEHIGH COUNTY RECORDER OF DEEDS
RECEIPT

ANDREA E. NAUGLE
Recorder of Deeds Division
Lehigh County Courthouse
455 W. Hamilton Street - Room 122
Allentown, PA 18101-1614
610-782-3162

Inv Number: 184649 Invoice Date: 09/18/2013 11:00:41 AM **RECEIPT** Reg/Drw ID: **0501**
Customer: **Last Change:** **Receipt By: OVERNITE** **By: AME**
DRINKER BIDDLE & REATH LLP
ONE LOGAN SQUARE
STE 2000
PHILADELPHIA, PA 19103

Chg #	Charge / Payment/ Fee Description	Amount	Inst # / Inst Date	Municipality
1	MISCELLANEOUS Grantor - SCHNEIDER ELECTRIC USA INC Grantee - UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION III Return Via - MAIL PARCEL IDENTIFICATION 549454705669-1 Fee Detail: COUNTY RECORDING FEE \$13.00 IMPROVEMENT FEE - COUNTY \$2.00 IMPROVEMENT FEE-RECORDER \$3.00 PER PAGE FEE \$14.00 UPI CERTIFICATION FEE \$10.00 STATE WRIT FEE \$0.50 Inst Info: 556 MINOR ST	\$42.50	2013035901 09/18/2013 11:00:41 AM Total Pages: 12	EMMAUS BOROUGH OF
2	REJECTION FEE	\$10.00		
	TOTAL CHARGES	\$52.50		
	PAYMENTS			
	CHECK: 1277994 - DRINKER BIDDLE & REATH LLP	\$52.50		
	TOTAL PAYMENTS	\$52.50		
	AMOUNT DUE	\$52.50		
	PAYMENT ON INVOICE	(\$52.50)		
	BALANCE DUE	\$0.00		

The Policy of the County of Lehigh is not to mail refunds of two dollars (\$2.00) or less.

Parcel No. 549454705669-1
Grantor: Schneider Electric, USA, Inc.
Property Address: 556 Minor Street
Emmaus, Lehigh County, PA

When recorded, return to:

Bonnie Allyn Barnett, Esq.
Drinker Biddle & Reath LLP
One Logan Square
18th and Cherry Streets
Philadelphia, PA 19103-6996

Environmental Covenant

This Environmental Covenant ("Environmental Covenant") is made this **&J.** **of** , 2013, and is executed pursuant to the Pennsylvania Uniform Environmental Covenants Act, Act No. 68 of 2007, 27 Pa. C.S. §§ 6501-6517 C'UECA"). This Environmental Covenant subjects the Property identified below to the activity and/or use limitations in this document. As indicated later in this document, this Environmental Covenant has been approved by the U.S. Environmental Protection Agency ("EPA" or "Agency").

WHEREAS, the property affected by this Environmental Covenant is located at 556 Minor Street in the Borough of Emmaus, County of Lehigh, Commonwealth of Pennsylvania, Parcel Number 549454705669-1, and is more particularly described in Exhibit A attached hereto and depicted in the map attached as Exhibit B hereto (hereinafter referred to as "the Property"); and

WHEREAS, "Schneider Electric USA, Inc., a Delaware corporation, formerly known as Square D Company, formerly known as Square D, Inc., successor by way of merger with Square D Company, a Michigan corporation, successor by way of merger with Bell Electric Company, an Illinois corporation, is the owner of the Property and the GRANTOR and GRANTEE ("Holder") of this Environmental Covenant. Schneider Electric's mailing address is Schneider Electric, Director of Environment, 1415 South Roselle Road, Palatine, IL 60067; and

WHEREAS, the Property is part of the Rodale Manufacturing Superfund Site ("Superfund Site") listed on the Superfund National Priorities List by the EPA by publication in the Federal Register on October 14, 1992, 57 Fed. Reg. 47180; and

WHEREAS, EPA and Square D Company ("Square D") executed an Administrative Order on Consent ("AOC"), effective September 21, 1992, to conduct a Remedial Investigation and Feasibility Study ("RI/FS"). Square D completed the RI Report in March 1998 and the FS Report in February 1999; and

WHEREAS, the following contaminants were found in both the soil and ground water at the Site through 1993 sampling: cyanide, nickel, barium, cadmium, chromium, manganese, lead, toluene, tetrachloroethene, 1,1-dichloroethene, trichloroethene, bis(2-ethylhexyl)phthalate, and xylene. Vinyl chloride was found only in ground water. All of these contaminants are listed hazardous substances, as defined by CERCLA §101(14), because they are listed in 40 C.F.R. Part 302.4; and

WHEREAS, on September 30, 1994, EPA and Square D entered into an Administrative Order by Consent for Removal Response Action, pursuant to which Square D conducted a removal action at the Superfund Site to remediate and limit the migration of contaminated ground water through, among other things, a groundwater treatment system ("GWTS"); and

WHEREAS, a Record of Decision ("ROD") was issued for the Superfund Site on September 30, 1999 which provides for hydraulic containment of the highest levels of contaminated ground water using the existing GWTS, monitored natural attenuation, and implementation of activity and use restrictions, listed below at Paragraph 1(a) through 1(f), and the notices, among other things (collectively "Remedial Action"); and

WHEREAS, EPA and the Pennsylvania Department of Environmental Protection ("PADEP") entered into a Consent Decree with Square D on March 22, 2002 ("Consent Decree") for reimbursement of EPA's and PADEP's incurred costs and performance of the Remedial Action by Square D;

Whereas, in September 2003, Square D completed construction of the Remedial Action and, since then, has continued operation of the pump and treat system and monitoring of natural attenuation. A five year review of the remedy was conducted in September 2008;. The Consent Decree provides both for access and institutional controls for the Property; and

WHEREAS, the administrative record pertaining to the environmental response project described in the ROD and Administrative Order is located at US EPA Region III, Public Reading Room, 1650 Arch Street, 6th Floor, Philadelphia, Pennsylvania, 19103 and at the Emmaus Public Library, 11 East Main Street, Emmaus, Pennsylvania, 18049, and can be found online at:

http://loggerhead.epa.gov/arweb/public/search_results.jsp?siteid=PAD981033285

WHEREAS, Square D has granted access to the Property to EPA, PADEP, and their respective employees, agents, consultants, contractors, and other authorized representatives, and further access to the Property shall be governed by the terms of this Environmental Covenant; and

WHEREAS, to prevent exposure and abate hazards to human health and/or the environment, and to maintain and protect any remedial systems implemented as part of a response action required by EPA, Square D desires to impose certain restrictions upon the use, occupancy, and activities of and at the Property; and

EXHIBIT "A"

LEGAL DESCRIPTION OF PROPERTY

ALL THOSE CERTAIN three (3) parcels of land, more specifically bounded and described as follows, to wit:

Parcel No. 1: ALL THAT CERTAIN factory building and parcel of land situate on the Southeast corner of Minor and Sixth Streets, in the Borough of Emmaus, in the County of Lehigh and State of Pennsylvania, bounded and described as follows, to wit:

BEGINNING at a point where the building lines of said Minor and Sixth Streets intersect each other; thence in and along the building line of said Minor Street North sixty-four degrees and thirty-eight minutes East, one hundred fifty (150) feet to a twenty foot wide alley; thence along the same South, 25 degrees and 22 minutes East, one hundred seventy-eight (178) feet to lands of Perkiomen Railroad Company; thence along the same Southwesterly, around a railroad curve of three degrees and 30 minutes curvature, one hundred seventy-five (175) feet, more or less, to the building line of said Sixth Street; thence in and along the same North, 25 degrees and twenty-two minutes West, two hundred fifty-three (253) feet to the place of beginning.

Parcel No. 2: ALL THAT CERTAIN messuage, tenement and lot or piece of ground situate on the Southeast corner of Minor Street and a twenty foot wide alley, in the Borough of Emmaus, County of Lehigh and State of Pennsylvania, and known as No. 562 Minor Street and bounded and described as follows, to wit:

BEGINNING at the intersection of the building line of Minor Street and a twenty foot wide alley, thence extending along said Minor Street North sixty-four degrees East, fifty feet to property hereinafter described; thence extending along said lot South twenty-six degrees East one hundred and fifty (150) feet to an alley; thence extending along said alley South sixty-four degrees West, fifty (50) feet to a twenty (20) foot wide alley; thence extending along said alley, North twenty-six degrees West, one hundred fifty (150) feet to the place of beginning.

CONTAINING seventy-five hundred (7500) square feet of land and formerly known as Lot No. 44 of the Plan of the Emmaus Iron Company.

AND ALSO, ALL THAT CERTAIN lot or piece of ground situate in the South side of Minor Street, between Fifth and Sixth Streets in the aforesaid Borough, County and State, bounded and described as follows, to wit:

BEGINNING at a point on Minor Street two hundred and twenty (220) feet East of Sixth Street, thence along Minor Street North sixty-five degrees East, forty (40) feet to lot now or late of Joseph Walker; thence along same South twenty-five degrees East, one hundred fifty (150) feet to an alley; thence along same South sixty-five degrees West forty (40) feet to property above described; thence along same North twenty-five degrees West, one hundred and fifty (150) feet to the place of beginning.

CONTAINING six thousand (6,000) square feet of land.

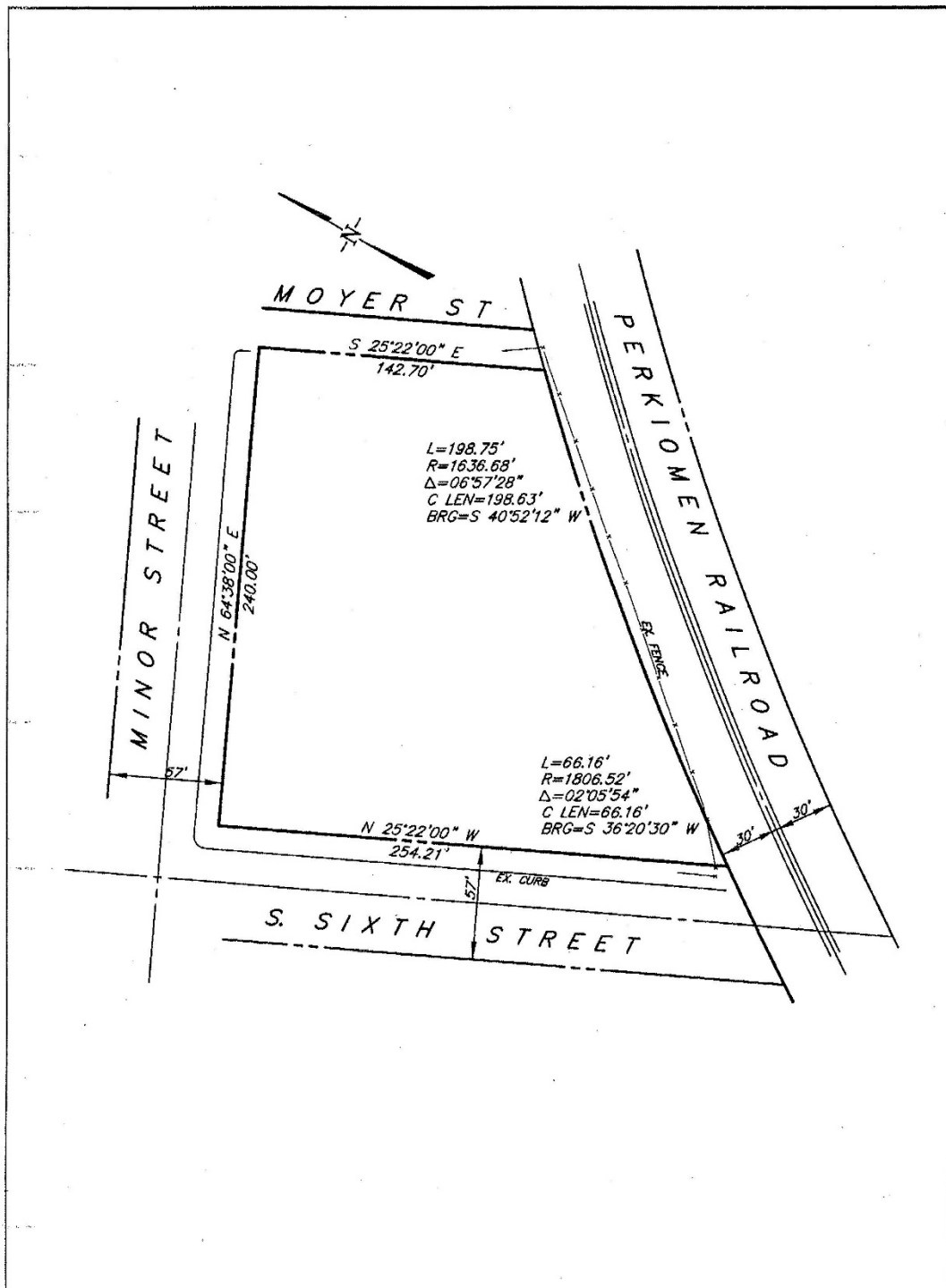
Parcel No. 3: ALL THAT CERTAIN triangular piece of ground situate on the East site of Moyer Street, in the Borough of Emmaus, County of Lehigh and State of Pennsylvania, bounded and described as follows, to wit:

BEGINNING at a point on the eastern building line of Moyer Street, said point being one hundred fifty (150) feet South of the Southern building line of Minor Street; thence in an Easterly direction and parallel with Minor Street, forty-nine and one-tenth (49.1) feet to the Right of Way line of the Perkiomen Railroad; thence along and concentric with the Right of Way of the Perkiomen Railroad fifty-two and eight tenths (52.8) feet to a point in the Eastern building line of Moyer Street; thence along same in a Northerly direction nineteen and seventy-six hundredths (19.76) feet to the place of beginning.

BEING as to Parcels No. 1, 2 and 3 the same premises which Rodale Mfg., Co., Inc., a/k/a Rodale Manufacturing Company, Inc., a Pennsylvania corporation granted and conveyed unto Bell Electric Company, an Illinois corporation by Deed dated July 15, 1975 and recorded July 15, 1975 in Deed Book Volume 1206 page 1049, and which Bell Electric Company, which became Square D Company pursuant to Certificate of Merger effective as of December 31, 1975 filed with the Michigan Department of Commerce -Corporation and Services Bureau on December 30, 1975 (and recorded in Misc. Book 514 Page 1095), and _____ filed with the Illinois Secretary of State on _____, conveyed to Square D Company by confirmatory deed recorded immediately prior to this Agreement.

BEING Tax Parcel 549454705669-1.

EXHIBIT B



NOW, THEREFORE, in consideration of the mutual covenants set forth herein, Schneider Electric USA, Inc. agrees as follows:

1. Restrictions. In furtherance of the purposes of this Environmental Covenant, Schneider Electric USA, Inc. shall abide by, and impose upon subsequent owner(s) of the Property, the restrictions as set forth in the subparagraphs below:

- a. The Property shall not be used in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial measures implemented and to be implemented pursuant to the ROD and Consent Decree;
- b. There shall be no newly commenced or expanded groundwater pumping in any aquifer at or under the Property which will adversely affect migration of the plume, as described in the ROD (except as required or approved by EPA);
- c. There shall be no installation of any new groundwater wells on the Property, except as required for implementation of the Remedial Action;
- d. There shall be no use of groundwater wells (new or existing) for human consumption on the Property;
- e. The Property shall not be developed or used in any manner that will adversely affect the hydraulic containment and plume migration as described in the ROD; and
- f. Prior to any construction of structures on the Property or any new use of existing structure(s) on the Property, which may be occupied by humans for 8 hours or more per day, Owner shall complete a Vapor Intrusion ("VI") Study, consistent with EPA's relevant VI guidance, to determine the potential risk of exposure to VOCs from soils and/or ground water into the indoor air of such structure(s). Owner shall notify EPA Region 3 and PADEP prior to conducting the VI Study. Owner also shall submit any completed VI Study to EPA for review.

2. Access. Schneider Electric USA, Inc. agrees to permit EPA and PADEP and their employees, agents, consultants, contractors and other authorized representatives vehicular and pedestrian access to the Property, at reasonable times, and to other lands owned by Schneider Electric USA, Inc. to which access is necessary to access the Property, for purposes of the following activities:

- a. Monitoring the Work, as that term is defined in the Consent Decree;
- b. Verifying any data or information submitted to the United States or the Commonwealth;
- c. Conducting investigations relating to contamination at or near the Site;
- d. Obtaining samples;
- e. Assessing the need for, planning, or implementing additional response actions at or near the Site;

- f. Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Square D or its agents, consistent with Section XXIV ("Access to Information") of the Consent Decree;
- g. Assessing Defendant's compliance with the Consent Decree;
- h. Determining whether the Site is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, by Institutional Controls established pursuant to the Consent Decree; and
- 1. Other activities directed by EPA or PADEP, not inconsistent with EPA's National Oil and Hazardous Substances Pollution Contingency Plan.

3. **Notice of Limitations in Future Conveyances.** In the event of any change in ownership or control of any portion of the Property, Owner shall notify EPA and PADEP in writing within thirty (30) calendar days after such change and shall provide a copy of and the recorded location of this Environmental Covenant to the transferee prior to finalizing any agreement for transfer; Schneider Electric USA, Inc. shall include in any instrument conveying any interest or rights with respect to any portion of the Property, including, but not limited to, deeds, leases, contracts, and purchase money mortgages, a provision expressly stating the activity and use limitations and grants of access and requiring transferee to comply with the provisions of the Environmental Covenant. The failure to include such provision shall not affect the validity or applicability of this Environmental Covenant on the Property.

4. **Binding Effect.** All the terms, covenants and conditions of this Environmental Covenant shall run with the land and shall be binding on the Owner during its period of ownership or possession of the Property and the Owner's successors and assigns and each owner and any other party entitled to possession or use of the Property during its period of ownership or possession pursuant to UECA, 27 Pa. C.S. § 6505(a).

5. **Recordation.** Within 30 days after the date of EPA's approval of this Environmental Covenant or any amendment or termination of this Environmental Covenant, Owner shall file this Environmental Covenant with the Recorder of Deeds for Lehigh County in the same manner as a deed to the Property.

6. **Amendment and Release of Environmental Covenant.** This Environmental Covenant or any specific restrictions herein may only be amended or released in accordance with UECA, 27 Pa. C.S. § 6509 and 27 Pa. C.S. § 6510.

7. **Notices.**

- a. Owner and all successors and assigns in interest shall provide a copy of this Environmental Covenant and any future covenants, agreements and orders relating to investigation or remediation of contamination on the Property and any and all future cleanup or remediation plans relating to the Property, including without limitation, any institutional controls approved by EPA or PADEP and any grants of access, with any and all deeds, easements, leases or other instruments, including but not limited to purchase money mortgages, that convey or otherwise create an estate or other interest in all or any portion of the Property.
- b. Within 60 days of recordation, Schneider Electric USA, Inc. shall distribute a file-and-date stamped copy of the recorded Environmental Covenant to: EPA, PADEP, Lehigh County, each person holding a recorded interest in the Property, each person in possession of the Property subject to the Environmental Covenant, and any other person required by EPA. Any notices to EPA and PADEP shall be made in writing and mailed to:

EPA:

Charlie Root, Remedial Project Manager
United States EPA Region III
Hazardous Sites Cleanup Division
1650 Arch Street
Philadelphia, PA 19103

PADEP:

Ronald C. Schock, Licensed Professional Geologist
Department of Environmental Protection
Bethlehem District Office
4530 Bath Pike
Bethlehem, PA 18017

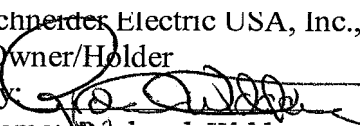
8. **Compliance Reporting.** By the end of every January following the effective date of this Environmental Covenant, Schneider Electric USA, Inc. and each subsequent owner shall submit, to EPA and PADEP, written documentation stating whether or not the activity and use limitations in this Environmental Covenant are being abided by. Schneider Electric USA, Inc. and each subsequent owner shall submit to EPA and PADEP, written documentation following transfer of the Property, concerning proposed changes in use of the Property, filing of applications for building permits for the Property, or proposals for any Superfund site work affecting the contamination on the Property subject to this Environmental Covenant.

9. **Compliance Enforcement.** Compliance with this Environmental Covenant may be enforced pursuant to UECA, 27 Pa. C.S. § 6511.
10. **Severability.** If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.
11. **Governing Law.** This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the Commonwealth of Pennsylvania.
12. **PADEP Registry.** Upon PADEP's establishment of an environmental covenant registry pursuant to UECA, 27 Pa. C.S. § 6512, Square D shall file this Environmental Covenant in the registry and provide notice of registration to EPA.
13. **Savings Provision.** This Environmental Covenant shall not be construed to restrict the rights and obligations that Square D has *inter se* under other agreements and instruments.
14. **Effective Date.** The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a deed record for the Property with the Lehigh County Recorder's Office.

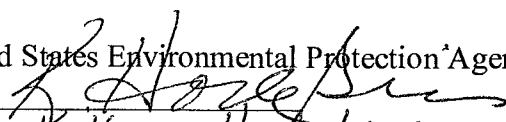
EXHIBIT A- Legal Description of Property from Square D's draft Easement with metes and bounds.

EXHIBIT B -Map of Property.

ACKNOWLEDGMENTS by Owner and any Holder:

Schneider Electric USA, Inc.,
 Owner/Holder
 Date: 7/22/2013
 By: 
 Name: Richard Widdowson
 Title: V.P. Safety, Environmental & Real Estate

APPROVED by:

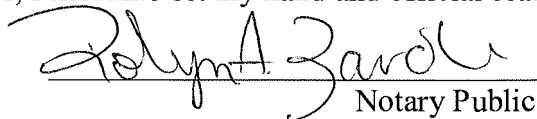
Date: B/:Job/ ?>

 Name: Kathryn Hodgkins
 Title: Acting Director Hazardous Site Cleanup Division

STATE OF ILLINOIS

COUNTY OF COOK

On this 22nd day of July, 2013, before me, the undersigned officer, personally appeared Richard Widdowson [Owner, Grantor] who acknowledged himself/herself to be the person whose name is subscribed to this Environmental Covenant, and acknowledged that he/she, as such officer, being authorized to do so, executed same for the purposes therein contained.

In witness whereof, I hereunto set my hand and official seal.


Notary Public

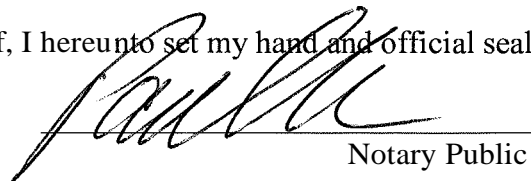


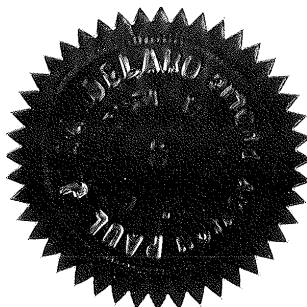
COMMONWEALTH OF PENNSYLVANIA

COUNTY OF PHILADELPHIA:

On this 20 day of August, 2013, before me, the undersigned officer, personally appeared ATJ & f.v J4...0'fK. who acknowledged himself/herself to be the L.k-r: :J...z...('f(L of the Hazardous Site Cleanup Division of the United States Environmental Protection Agency, Region III, and that he/she, as such duly authorized representative, executed the foregoing Environmental Covenant for the purposes therein contained.

In witness whereof, I hereunto set my hand and official seal.


Notary Public



COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Paul J. Andelaro, Notary Public
City of Philadelphia, Philadelphia County
My commission expires August 29, 2013

ANDREA E. NAUGLE
LEHIGH COUNTY CLERK OF JUDICIAL RECORDS



Recorder of Deeds Division
Deborah A. Casciotti, Chief Deputy
Lehigh County Courthouse
455 W. Hamilton Street - Room 122
Allentown, PA 18101-1614
(610) 782-3162

*RETURN DOCUMENT TO:
DRINKER BIDDLE & REATH LLP
BONNIE A BARNETT ESQ
ONE LOGAN SQUARE , SUITE 2000
PHILADELPHIA, PA 19103

Instrument Number - 2013035901

Recorded On 9/18/2013 At 11:00:41 AM

* Instrument Type - MISCELLANEOUS

Invoice Number - 184649 User ID: AME

* Grantor - SCHNEIDER ELECTRIC USA INC

* Grantee - UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION III

* Customer - DRINKER BIDDLE & REATH LLP

***Total Pages - 12**

* FEES

STATE WRIT TAX	\$0.50
RECORDING FEES	\$27.00
COUNTY ARCHIVES FEE	\$2.00
ROD ARCHIVES FEE	\$3.00
UPI CERTIFICATION FEES	\$10.00
TOTAL PAID	\$42.50

I hereby CERTIFY that this document is
Recorded in the Recorder of Deeds Office
of Lehigh County, Pennsylvania



Andrea E. Naugle
Andrea E. Naugle
Clerk of Judicial Records
Recorder of Deeds Division

LCGIS Registry UPI Certification
On September 18, 2013 By SB

THIS IS A CERTIFICATION PAGE

Do Not Detach

THIS PAGE IS NOW PART OF THIS LEGAL DOCUMENT

* - Information denoted by an asterisk may change during the verification process and may not be reflected on this page.

INSTRUMENT NUMBER - 2013035901



APPENDIX D – TABLES

Table 6 Detected Constituents in Groundwater – Inside the Probable DNAPL Zone

Table 7 Detected Constituents in Groundwater – Outside the Probable DNAPL Zone

Table 8 Mann-Kendall Trend Analysis Summary

TABLE 6
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE
MANUFACTURING SITE
EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-1					
			05/01/12 EXW-1 (Well 3)	04/29/13 EXW-1 (Well 3)	04/21/14 EXW- 1(WELL3)	05/04/15 EXW-1 (WELL 3)	11/15/16 EXW-1	11/13/17 EXW-1
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U] ^{(e)(f)}	0.5 U [0.5 U]	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
1,1,2-trichloro-1,2,2- trifluoroethane	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	2.0 U [2.0 U]	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
1,1-Dichloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
1,1-Dichloroethene	4	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	2.0 U [2.0 U]	2.0 U
1,2-Dibromoethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE
MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-1					
			05/01/12 EXW-1 (Well 3)	04/29/13 EXW-1 (Well 3)	04/21/14 EXW- 1(WELL3)	05/04/15 EXW-1 (WELL 3)	11/15/16 EXW-1	11/13/17 EXW-1
Volatile Organics								
1,2-Dichloropropane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
2-Butanone	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	3.0 U [3.0 U]	3.0 U
2-Hexanone	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	3.0 U [3.0 U]	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	3.0 U [3.0 U]	3.0 U
Acetone	3,700	µg/L	10 U [10 U]	10 U [10 U]	20 U [20 U]	20 U [20 U]	6.0 U [6.0 U]	6.0 U
Benzene	0.4	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Bromodichloromethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Bromoform	--	µg/L	10 U [10 U]	10 U [10 U]	4.0 U [4.0 U]	4.0 U [4.0 U]	0.5 U [0.5 U]	0.5 U
Bromomethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE
MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-1					
			05/01/12 EXW-1 (Well 3)	04/29/13 EXW-1 (Well 3)	04/21/14 EXW- 1(WELL3)	05/04/15 EXW-1 (WELL 3)	11/15/16 EXW-1	11/13/17 EXW-1
Volatile Organics								
Carbon Disulfide	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Chlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Chloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Chloroform	0.15	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Chloromethane	2	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
cis-1,2-Dichloroethene	40	µg/L	8.0 J [8.0 J]	5.0 J [5.0 J]	6.0 [6.0]	8.0 [12]^(g)	4.0 [3.0]	3.0
cis-1,3-Dichloropropene	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Cyclohexane	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	2.0 U [2.0 U]	2.0 U
Dibromochloromethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-1					
			05/01/12 EXW-1 (Well 3)	04/29/13 EXW-1 (Well 3)	04/21/14 EXW-1 (WELL3)	05/04/15 EXW-1 (WELL 3)	11/15/16 EXW-1	11/13/17 EXW-1
Volatile Organics								
Ethylbenzene	700	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Isopropylbenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
Methyl Acetate	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U
Methylcyclohexane	--	µg/L	1.0 J [1.0 J]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
Methylene Chloride	--	µg/L	10 U [10 U]	10 U [10 U]	3.0 U [3.0 U]	4.0 U [4.0 U]	2.0 U [2.0 U]	0.5 U
Styrene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
Tetrachloroethene	1.1	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	2.0 [3.0] ^(h)	0.5 U [0.5 U]	0.5 U
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA (i)	NA	NA
Toluene	380	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U [0.5 U]	0.5 U

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE
MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-1					
			05/01/12 EXW-1 (Well 3)	04/29/13 EXW-1 (Well 3)	04/21/14 EXW- 1(WELL3)	05/04/15 EXW-1 (WELL 3)	11/15/16 EXW-1	11/13/17 EXW-1
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U [10.0 U]	9.00 B [4.70 B]	6.80 U [6.80 UJ]	7.20 U [7.20 U]	9.7 U [9.7 U]	9.6 U
Ferrous Iron	300	µg/L	0.035 J [0.03 J]	15.0 J [41.0 J]	R [R]	10.0 U [13.0 J]	69 [15 U]	15 U
Lead	5	µg/L	8.20 [8.30]	3.00 U [3.00 U]	4.70 U [4.70 U]	4.70 U [4.70 U]	6.2 U [6.2 U]	6.0 U
Manganese	50	µg/L	15.4 [16.0]	R [56.0]	5.40 [5.60]	6.60 [6.30]	7.3 [5.8]	2.4 J
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	167 [149]	169 [172]	169 [169]	174 [168]	163 [166 B]	165
Alkalinity to pH 8.3	--	mg/L	0.7 U [0.7 U]	2 U [2 U]	2 U [2 U]	2 U [2 U]	1.7 U [1.7 U]	1.7 U
Chloride	250	mg/L	14.4 [14.4]	13.5 [13.6]	13.3 [13.3]	13.5 [14.8]	15.1 [14.8]	15.6
Nitrate Nitrogen	--	mg/L	3.4 [3.4]	3.2 [3.3]	3.1 [3]	3 [3.3]	3.3 [3.3]	3.2 J-
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	16.5 [16.5]	15.2 [15.9]	14.4 [14]	14.6 [14.7]	14.8 [13.7]	14.7
Total Organic Carbon	--	mg/L	0.81 J [0.67 J]	1 U [1 U]	1 UB [1 UB]	1 U [1 U]	0.50 U [0.50 U]	0.50 U

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE
MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-1					
			05/01/12 EXW-1 (Well 3)	04/29/13 EXW-1 (Well 3)	04/21/14 EXW- 1(WELL3)	05/04/15 EXW-1 (WELL 3)	11/15/16 EXW-1	11/13/17 EXW-1
Gases								
Carbon Dioxide	--	µg/L	8,000 J [8,100 J]	6,700 J [7,000 J]	7,400 J [8,500 J]	8,400 J [8,500 J]	7,700 J [9,000 J]	8,600 J
Ethane	--	µg/L	5 U [5 U]	5 U [5 U]	5 U [5 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
Ethene	--	µg/L	5 U [5 U]	5 U [5 U]	5 U [5 U]	5.0 U [5.0 U]	1.0 U [1.0 U]	1.0 U
Methane	--	µg/L	17 [17]	7.7 [11]	5 U [5 U]	5.0 U [5.0 U]	3.0 U [3.0 U]	3.0 U

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-2					
			05/01/12 EXW-2 (Well 4)	04/29/13 EXW-2 (Well 4)	04/21/14 EXW- 2(WELL4)	05/04/15 EXW-2 (WELL 4)	11/15/16 EXW-2	11/13/17 EXW-2
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
1,1,2,2-Tetrachloroethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	200 U	500 U	100 U	50 UJ	20 U	NA [NA]
1,1,2-Trichloroethane	0.19	µg/L	200 U	500 U	6.0 J	4.0 J	5.0 U	3 U [3U]
1,1-Dichloroethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
1,1-Dichloroethene	4	µg/L	200 U	500 U	6.0 J	4.0 J	5.0 U	3 U [3U]
1,2,4-Trichlorobenzene	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
1,2-Dibromo-3-chloropropane	--	µg/L	200 U	500 U	50 U	25 U	20 U	10 U [10 U]
1,2-Dibromoethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
1,2-Dichlorobenzene	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
1,2-Dichloroethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-2					
			05/01/12 EXW-2 (Well 4)	04/29/13 EXW-2 (Well 4)	04/21/14 EXW- 2(WELL4)	05/04/15 EXW-2 (WELL 4)	11/15/16 EXW-2	11/13/17 EXW-2
Volatile Organics								
1,2-Dichloropropane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
1,3-Dichlorobenzene	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
1,4-Dichlorobenzene	--	µg/L	200 U	500 U	50 U	25 U	10U	5 U [5U]
2-Butanone	--	µg/L	200 U	500 U	100 U	50 U	30 U	15 U [15U]
2-Hexanone	--	µg/L	200 U	500 U	100 U	50 U	30 U	15 U [15U]
4-Methyl-2-pentanone	--	µg/L	200 U	500 U	100 U	50 U	30 U	15 U [15U]
Acetone	3,700	µg/L	200 U	500 U	200 U	100 U	60 U	30 U [30 U]
Benzene	0.4	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Bromodichloromethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Bromoform	--	µg/L	200 U	500 U	40 U	20 U	5.0 U	3 U [3U]
Bromomethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER								
RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-2					
			05/01/12 EXW-2 (Well 4)	04/29/13 EXW-2 (Well 4)	04/21/14 EXW- 2(WELL4)	05/04/15 EXW-2 (WELL 4)	11/15/16 EXW-2	11/13/17 EXW-2
Volatile Organics								
Carbon Disulfide	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
Carbon Tetrachloride	0.16	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Chlorobenzene	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Chloroethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Chloroform	0.15	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Chloromethane	2	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
cis-1,2-Dichloroethene	40	µg/L	1,800	1,400	1,400	910	640	490 [490]
cis-1,3-Dichloropropene	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Cyclohexane	--	µg/L	200 U	500 U	50 U	25 U	20 U	10 U [10 U]
Dibromochloromethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Dichlorodifluoromethane	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-2					
			05/01/12 EXW-2 (Well 4)	04/29/13 EXW-2 (Well 4)	04/21/14 EXW- 2(WELL4)	05/04/15 EXW-2 (WELL 4)	11/15/16 EXW-2	11/13/17 EXW-2
Volatile Organics								
Ethylbenzene	700	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Isopropylbenzene	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
Methyl Acetate	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
Methyl tert-butyl ether	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Methylcyclohexane	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
Methylene Chloride	--	µg/L	200 U	500 U	30 U	20 U	20 U	3 U [3U]
Styrene	--	µg/L	200 U	500 U	50 U	25 U	10 U	5 U [5U]
Tetrachloroethene	1.1	µg/L	110 J	80 J	87	41	27	24 [23]
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
trans-1,2-Dichloroethene	50	µg/L	200 U	500 U	9.0 J	7.0	5.0 U	4 J [6]

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER								
RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-2					
			05/01/12 EXW-2 (Well 4)	04/29/13 EXW-2 (Well 4)	04/21/14 EXW- 2(WELL4)	05/04/15 EXW-2 (WELL 4)	11/15/16 EXW-2	11/13/17 EXW-2
Volatile Organics								
trans-1,3-Dichloropropene	--	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Trichloroethene	1.6	µg/L	20,000 D	19,000 D	14,000 D	6,500 D	6,100	4,200 [4,200]
Trichlorofluoromethane	--	µg/L	200 U	500 U	10 U	5.0 UJ	5.0 U	3 U [3U]
Vinyl Chloride	0.019	µg/L	110 J	500 U	77	93	36	21 [20]
Xylenes (total)	4,000	µg/L	200 U	500 U	10 U	5.0 U	5.0 U	3 U [3U]
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U [9.6 U]
Ferrous Iron	300	µg/L	0.1 UB	100 UB	39.0 J	R	28 J	15 UJ [15 UJ]
Lead	5	µg/L	5.80	3.00 U	4.70 U	4.70 U	6.2 U	6.0 U [6.0 U]
Manganese	50	µg/L	216	240	275	R	269	242 [256]
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 UJ	7.20 U	9.7 U	9.6 U [9.6 U]
Ferrous Iron	300	µg/L	0.025 J	20.0 J	R	R	110	30 J [15 U]
Lead	5	µg/L	6.80	3.00 U	4.70 U	4.70 U	6.2 U	6.0 U [6.0 U]
Manganese	50	µg/L	170	174	231	R	266	231 [233]

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-2					
			05/01/12 EXW-2 (Well 4)	04/29/13 EXW-2 (Well 4)	04/21/14 EXW- 2(WELL4)	05/04/15 EXW-2 (WELL 4)	11/15/16 EXW-2	11/13/17 EXW-2
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	29.6	31.1	29	29.2	24.6 B	24.0 [23.1]
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U [1.7 U]
Chloride	250	mg/L	21.7	19.3	19.1	23.1	21.6	23.1 [22.3]
Nitrate Nitrogen	--	mg/L	7.3	6.1	5.9	6.9	8.0	8.1 [8.3]
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	11.4	9.2	6.3	4.9 J	5.0 J	5.0 J [4.2 J]
Total Organic Carbon	--	mg/L	0.68 J	1 U	1.2 UB	1 U	0.50 U	0.50 U [0.50 U]
Gases								
Carbon Dioxide	--	µg/L	110,000	98,000 J	91,000	98,000	110,000	110,000 [110,000]
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U [1.0 U]
Ethene	--	µg/L	7.2	8.3	8	12	2.4 J	1.4 J [1.4 J]
Methane	--	µg/L	170	130 J	92	130 J	33	21 [18]

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards^(a)	Units	05/01/12 EXW-3 (RW- 3R)	04/29/13 EXW-3 (RW- 3R)	05/04/15 EXW-3 (RW- 3R)	11/16/16 EXW-3R	01/25/17 EXW-3R	11/13/17 EXW-3R
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	500 U	500 U	100 U	500 U	500 U	25 U
1,1,2,2-Tetrachloroethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	500 U	500 U	1,000 U	2000	2,000 U	NA
1,1,2-Trichloroethane	0.19	µg/L	500 U	500 U	110	500 U	500 U	71
1,1-Dichloroethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
1,1-Dichloroethene	4	µg/L	500 U	500 U	100	500 U	500 U	43 J
1,2,4-Trichlorobenzene	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
1,2-Dibromo-3-chloropropane	--	µg/L	500 U	500 U	500 U	2,000 U	2,000 U	100 U
1,2-Dibromoethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
1,2-Dichlorobenzene	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
1,2-Dichloroethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
1,2-Dichloropropane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
1,3-Dichlorobenzene	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
1,4-Dichlorobenzene	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
2-Butanone	--	µg/L	500 U	500 U	1,000 U	3,000 U	3,000 U	150 U
2-Hexanone	--	µg/L	500 U	500 U	1,000 U	3,000 U	3,000 U	150 U
4-Methyl-2-pentanone	--	µg/L	500 U	500 U	1,000 U	3,000 U	3,000 U	150 U
Acetone	3,700	µg/L	500 U	500 U	2,000 U	6,000 U	6,000 U	300 U
Benzene	0.4	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Bromodichloromethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Bromoform	--	µg/L	500 U	500 U	400 U	500 U	500 U	25 U

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards^(a)	Units	05/01/12 EXW-3 (RW- 3R)	04/29/13 EXW-3 (RW- 3R)	05/04/15 EXW-3 (RW- 3R)	11/16/16 EXW-3R	01/25/17 EXW-3R	11/13/17 EXW-3R
Volatile Organics								
Bromomethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Carbon Disulfide	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
Carbon Tetrachloride	0.16	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Chlorobenzene	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Chloroethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Chloroform	0.15	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Chloromethane	2	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
cis-1,2-Dichloroethene	40	µg/L	1,700	1,600	22,000	12,000	10,000	7,800
cis-1,3-Dichloropropene	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Cyclohexane	--	µg/L	500 U	500 U	500 U	2,000 U	2,000 U	100 U
Dibromochloromethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Dichlorodifluoromethane	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Ethylbenzene	700	µg/L	500 U	500 U	59 J	500 U	500 U	25 U

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards^(a)	Units	05/01/12 EXW-3 (RW- 3R)	04/29/13 EXW-3 (RW- 3R)	05/04/15 EXW-3 (RW- 3R)	11/16/16 EXW-3R	01/25/17 EXW-3R	11/13/17 EXW-3R
Volatile Organics								
Isopropylbenzene	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
Methyl Acetate	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
Methylene Chloride	--	µg/L	500 U	500 U	400 U	2,000 U	2,000 U	25 U
Styrene	--	µg/L	500 U	500 U	500 U	1,000 U	1,000 U	50 U
Tetrachloroethene	1.1	µg/L	160 J	150 J	2,600	3,200	2,400	1,500
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	500 U	500 U	160	500 U	500 U	40 J
trans-1,2-Dichloroethene	50	µg/L	500 U	500 U	180	500 U	500 U	120
trans-1,3-Dichloropropene	--	µg/L	500 U	500 U	100 U	500 U	500 U	25 U
Trichloroethene	1.6	µg/L	21,000 D	22,000 D	370,000 D	370,000	400,000	150,000
Trichlorofluoromethane	--	µg/L	500 U	500 U	100 UJ	500 U	500 U	25 U
Vinyl Chloride	0.019	µg/L	500 U	500 U	440	700 J	720 J	430
Xylenes (total)	4,000	µg/L	500 U	500 U	220	500 U	500 U	28 J

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	05/01/12 EXW-3 (RW- 3R)	04/29/13 EXW-3 (RW- 3R)	05/04/15 EXW-3 (RW- 3R)	11/16/16 EXW-3R	01/25/17 EXW-3R	11/13/17 EXW-3R
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U [9.6 U]
Ferrous Iron	300	µg/L	0.1 UB	100 UB	39.0 J	R	28 J	15 <i>UJ</i> [15 <i>UJ</i>]
Lead	5	µg/L	5.80	3.00 U	4.70 U	4.70 U	6.2 U	6.0 U [6.0 U]
Manganese	50	µg/L	216	240	275	R	269	242 [256]
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 UJ	7.20 U	9.7 U	9.6 U [9.6 U]
Ferrous Iron	300	µg/L	0.025 J	20.0 J	R	R	110	30 J [15 U]
Lead	5	µg/L	6.80	3.00 U	4.70 U	4.70 U	6.2 U	6.0 U [6.0 U]
Manganese	50	µg/L	170	174	231	R	266	231 [233]
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	29.6	31.1	29	29.2	24.6 B	24.0 [23.1]
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U [1.7 U]
Chloride	250	mg/L	21.7	19.3	19.1	23.1	21.6	23.1 [22.3]
Nitrate Nitrogen	--	mg/L	7.3	6.1	5.9	6.9	8.0	8.1 [8.3]
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	11.4	9.2	6.3	4.9 J	5.0 J	5.0 J [4.2 J]
Total Organic Carbon	--	mg/L	0.68 J	1 U	1.2 UB	1 U	0.50 U	0.50 U [0.50 U]

TABLE 6

**DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER
RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	05/01/12 EXW-3 (RW- 3R)	04/29/13 EXW-3 (RW- 3R)	05/04/15 EXW-3 (RW- 3R)	11/16/16 EXW-3R	01/25/17 EXW-3R	11/13/17 EXW-3R
Gases								
Carbon Dioxide	--	µg/L	110,000	98,000 J	91,000	98,000	110,000	110,000 [110,000]
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U [1.0 U]
Ethene	--	µg/L	7.2	8.3	8	12	2.4 J	1.4 J [1.4 J]
Methane	--	µg/L	170	130 J	92	130 J	33	21 [18]

TABLE 6
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-4					
			05/02/12 MW-4	04/30/13 MW-4	04/23/14 MW-4	05/06/15 MW-4	11/22/16 MW-4	11/16/17 MW-4
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
1,1,2,2-Tetrachloroethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	100 U	100 U	20 U	20 U	10 U	NA [NA]
1,1,2-Trichloroethane	0.19	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
1,1-Dichloroethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
1,1-Dichloroethene	4	µg/L	100 U	100 U	4.0 J	5.0	5.0 J	2.0 [2.0]
1,2,4-Trichlorobenzene	--	µg/L	100 U	100 U	10 U	10 UJ	5.0 U	2.0 U [2.0 U]
1,2-Dibromo-3-chloropropane	--	µg/L	100 U	100 U	10 U	10 UJ	10 U	4.0 U [4.0 U]
1,2-Dibromoethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
1,2-Dichlorobenzene	--	µg/L	100 U	100 U	10 U	10 U	5.0 U	2.0 U [2.0 U]
1,2-Dichloroethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
1,2-Dichloropropane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
1,3-Dichlorobenzene	--	µg/L	100 U	100 U	10 U	10 U	5.0 U	2.0 U [2.0 U]
1,4-Dichlorobenzene	--	µg/L	100 U	100 U	10 U	10 U	5.0 U	2.0 U [2.0 U]
2-Butanone	--	µg/L	100 U	100 U	20 UJ	20 U	15 U	6.0 U [6.0 U]
2-Hexanone	--	µg/L	100 U	100 U	20 U	20 U	15 U	6.0 U [6.0 U]
4-Methyl-2-pentanone	--	µg/L	100 U	100 U	20 U	20 U	15 U	6.0 U [6.0 U]
Acetone	3,700	µg/L	100 U	100 U	40 UJ	40 U	30 U	12.0 U [12.0]
Benzene	0.4	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Bromodichloromethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Bromoform	--	µg/L	100 U	100 U	8.0 U	8.0 U	3.0 U	1.0 U [1.0 U]
Bromomethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Carbon Disulfide	--	µg/L	100 U	100 U	10 U	10 U	5.0 U	2.0 U [2.0 U]
Carbon Tetrachloride	0.16	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Chlorobenzene	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Chloroethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Chloroform	0.15	µg/L	100 U	100 U	1.0 J	2.0 J	3.0 U	1.0 J [1.0 U]

TABLE 6
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE
EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-4					
			05/02/12 MW-4	04/30/13 MW-4	04/23/14 MW-4	05/06/15 MW-4	11/22/16 MW-4	11/16/17 MW-4
Volatile Organics								
Chloromethane	2	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
cis-1,2-Dichloroethene	40	µg/L	53 J	33 J	18	14	13	14 [14]
cis-1,3-Dichloropropene	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Cyclohexane	--	µg/L	100 U	100 U	10 UJ	10 U	10 U	4.0 U [4.0 U]
Dibromochloromethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Dichlorodifluoromethane	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Ethylbenzene	700	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Isopropylbenzene	--	µg/L	100 U	100 U	10 U	10 U	5.0 U	2.0 U [2.0 U]
Methyl Acetate	--	µg/L	100 U	100 U	10 UJ	10 U	5.0 U	2.0 U [2.0 U]
Methyl tert-butyl ether	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Methylcyclohexane	--	µg/L	100 U	100 U	10 UJ	10 U	5.0 U	2.0 U [2.0 U]
Methylene Chloride	--	µg/L	100 U	100 U	6.0 U	8.0 U	10 U	1.0 U [1.0 U]
Styrene	--	µg/L	100 U	100 U	10 U	10 U	5.0 U	2.0 U [2.0 U]
Tetrachloroethene	1.1	µg/L	42 J	42 J	42	48	48	20 [19]
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
trans-1,2-Dichloroethene	50	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
trans-1,3-Dichloropropene	--	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Trichloroethene	1.6	µg/L	4,200 DJ	3,400 D	2,300 D	2,900 D	2,800	1,800 [1,700]
Trichlorofluoromethane	--	µg/L	100 U	100 U	2.0 J	2.0 J	3.0 U	1.0 U [1.0 U]
Vinyl Chloride	0.019	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]
Xylenes (total)	4,000	µg/L	100 U	100 U	2.0 U	2.0 U	3.0 U	1.0 U [1.0 U]

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-4					
			05/02/12 MW-4	04/30/13 MW-4	04/23/14 MW-4	05/06/15 MW-4	11/22/16 MW-4	11/16/17 MW-4
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U [9.6 U]
Ferrous Iron	300	µg/L	0.1 U	360	82.0 J	35.0 J	15 U	15 U [15 U]
Lead	5	µg/L	3.00 U	6.20	4.70 U	4.70 U	6.2 U	6.0 U [6.0 U]
Manganese	50	µg/L	6.40 B	126	38.2	55.5	88.7	115 [110]
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U [9.6 U]
Ferrous Iron	300	µg/L	0.012 J	100 UB	26.0 J	54.0 J	80	15 U [15 U]
Lead	5	µg/L	3.00 U	3.10	4.70 U	4.70 U	6.2 U	6.0 U [6.0 U]
Manganese	50	µg/L	3.20 B	49.4	36.6	53.2	88.9	106 [110]

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-4					
			05/02/12 MW-4	04/30/13 MW-4	04/23/14 MW-4	05/06/15 MW-4	11/22/16 MW-4	11/16/17 MW-4
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	28.9	60.2	35.2	22.1	36.1	26.8 [27.6]
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U [1.7 U]
Chloride	250	mg/L	4.4	14.4	40.9	34.9	61.5	48.6 J+ [50.8 J+]
Nitrate Nitrogen	--	mg/L	0.57	1.3	2.7	3.1	8.3	11.3 J+ [9.9 J+]
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	18.4	8.6	5.9	4 J	6.9	7.4 J+ [6.5 J+]
Total Organic Carbon	--	mg/L	1.9	1 U	0.72 J	1 U	0.50 U	0.50 U [0.50 U]
Gases								
Carbon Dioxide	--	µg/L	67,000	65,000	72,000	79,000	130,000	62,000 [64,000]
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U [1.0 U]
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U [1.0 U]
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U	3.0 U [3.0 UA96:II08]

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-1					
			05/04/12 MW-1	05/01/13 MW-1	04/22/14 MW-1	05/05/15 MW-1	11/16/16 MW-1	11/14/17 MW-1
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	20 U	50 U	10 U	10 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	20 U	50 U	5.0 U	5.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-1					
			05/04/12 MW-1	05/01/13 MW-1	04/22/14 MW-1	05/05/15 MW-1	11/16/16 MW-1	11/14/17 MW-1
Volatile Organics								
2-Butanone	--	µg/L	20 U	50 U	10 U	10 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	20 U	50 U	10 U	10 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	20 U	50 U	10 U	10 U	3.0 U	3.0 U
Acetone	3,700	µg/L	20 U	50 U	20 U	20 U	6.0 U	6.0 U
Benzene	0.4	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromoform	--	µg/L	20 U	50 U	4.0 U	4.0 U	0.5 U	0.5 U
Bromomethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Chlorobenzene	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloroethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-1					
			05/04/12 MW-1	05/01/13 MW-1	04/22/14 MW-1	05/05/15 MW-1	11/16/16 MW-1	11/14/17 MW-1
Volatile Organics								
Chloroform	0.15	µg/L	20 U	50 U	0.90 J	0.90 J	0.5 J	0.6 J
Chloromethane	2	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	100	33 J	26	18	14	20
cis-1,3-Dichloropropene	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	20 U	50 U	5.0 U	5.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-1					
			05/04/12 MW-1	05/01/13 MW-1	04/22/14 MW-1	05/05/15 MW-1	11/16/16 MW-1	11/14/17 MW-1
Volatile Organics								
Methylene Chloride	--	µg/L	20 U	50 U	3.0 U	4.0 U	2.0 U	0.5 U
Styrene	--	µg/L	20 U	50 U	5.0 U	5.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	7.0 J	7.0 J	9.0	11	5.0	4.0
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	3.0 J	50 U	0.90 J	0.70 J	0.5 U	0.5 J
trans-1,3-Dichloropropene	--	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	1,200 D	1,000 D	940 D	1,100 D	590	590
Trichlorofluoromethane	--	µg/L	20 U	50 U	1.0 J	1.0	0.9 J	0.5 U
Vinyl Chloride	0.019	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	20 U	50 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-1					
			05/04/12 MW-1	05/01/13 MW-1	04/22/14 MW-1	05/05/15 MW-1	11/16/16 MW-1	11/14/17 MW-1
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.034 J	39.0 J	140 J	97.0	110	15 U
Lead	5	µg/L	9.50	3.70 J	4.70 U	4.70 U	6.2 U	7.8 J <i>B</i>
Manganese	50	µg/L	113	183	220	200	179	474
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.022 J	37.0 J	100 J	100	84	15 U
Lead	5	µg/L	10.0 UB	4.10	4.70 U	4.70 U	6.2 U	6.0 U
Manganese	50	µg/L	114	179	228	185	228	181
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	5.2	4.4	6.6	7.5	10.1	21.9 <i>J</i>
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U
Chloride	250	mg/L	9.7	13.4	12.6	13.2	12.7	12.8
Nitrate Nitrogen	--	mg/L	14.2	18.6	15	13.4	12.4	13.3
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	2.9 J	5 U	5 U	5 U	2.6 J	2.3 J
Total Organic Carbon	--	mg/L	1 U	1 U	0.9 J	1 U	0.75 J	0.50 U
Gases								
Carbon Dioxide	--	µg/L	67,000	80,000	76,000	83,000	90,000	47,000
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U	3.4 J

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-4					
			05/01/12 EXW-4 (RW-4)	04/29/13 EXW-4 (RW-4)	04/21/14 EXW-4(RW-4)	05/04/15 EXW-4 (RW-4)	11/15/16 EXW-4	11/13/17 EXW-4
Volatile Organics								
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	200 U	200 U	20 U	100 U	25 U	10 U
1,1,2,2-Tetrachloroethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	200 U	200 U	200 U	1,000 U	100 U	NA
1,1,2-Trichloroethane	0.19	µg/L	200 U	200 U	11 J	96 J	25 U	10 U
1,1-Dichloroethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
1,1-Dichloroethene	4	µg/L	200 U	200 U	20 U	88 J	25 U	10 U
1,2,4-Trichlorobenzene	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U
1,2-Dibromo-3-chloropropane	--	µg/L	200 U	200 U	100 U	500 U	100 U	40 U
1,2-Dibromoethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
1,2-Dichlorobenzene	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U
1,2-Dichloroethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
1,2-Dichloropropane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
1,3-Dichlorobenzene	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U
1,4-Dichlorobenzene	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U
2-Butanone	--	µg/L	200 U	200 U	200 U	1,000 U	150 U	60 U
2-Hexanone	--	µg/L	200 U	200 U	200 U	1,000 U	150 U	60 U
4-Methyl-2-pentanone	--	µg/L	200 U	200 U	200 U	1,000 U	150 U	60 U
Acetone	3,700	µg/L	200 U	200 U	400 U	2,000 U	300 U	120 U
Benzene	0.4	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Bromodichloromethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Bromoform	--	µg/L	200 U	200 U	80 U	400 U	25 U	10 U
Bromomethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Carbon Disulfide	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-4					
			05/01/12 EXW-4 (RW-4)	04/29/13 EXW-4 (RW-4)	04/21/14 EXW-4(RW-4)	05/04/15 EXW-4 (RW-4)	11/15/16 EXW-4	11/13/17 EXW-4
Volatile Organics								
Carbon Tetrachloride	0.16	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Chlorobenzene	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Chloroethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Chloroform	0.15	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Chloromethane	2	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
cis-1,2-Dichloroethene	40	µg/L	1,300	1,500	1,800	18,000	2,400	1,900
cis-1,3-Dichloropropene	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Cyclohexane	--	µg/L	200 U	200 U	100 U	500 U	100 U	40 U
Dibromochloromethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Dichlorodifluoromethane	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Ethylbenzene	700	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Isopropylbenzene	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U
Methyl Acetate	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U
Methyl tert-butyl ether	--	µg/L	200 U	200 U	20 U	100 U	25 U	10 U
Methylcyclohexane	--	µg/L	200 U	200 U	100 U	500 U	50 U	20 U
Methylene Chloride	--	µg/L	200 U	200 U	60 U	400 U	100 U	10 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	EXW-4					
			05/01/12 EXW-4 (RW-4)	04/29/13 EXW-4 (RW-4)	04/21/14 EXW-4(RW-4)	05/04/15 EXW-4 (RW-4)	11/15/16 EXW-4	11/13/17 EXW-4
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	20.2	43.1	20.2	141	17.0	15.6
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U
Chloride	250	mg/L	24.7	29.6	36.9	46.3	34.1	30.9
Nitrate Nitrogen	--	mg/L				0.86	5.8	5.9
Nitrite Nitrogen	10	mg/L				NA	NA	NA
Sulfate	--	mg/L				73.9	15.1	12.3
Total Organic Carbon	--	mg/L				4.5	0.50 U	0.50 U
Gases								
Carbon Dioxide	--	µg/L	98,000	120,000	97,000	95,000	120,000	110,000
Ethane	--	µg/L	5 U	5 U	5 U	6.1	1.0 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	34	1.0 J	1.0 U
Methane	--	µg/L	34	42	45	240	17	6.5

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	Well 6					
			05/04/12 WELL-6	05/02/13 Well-6	04/23/14 WELL-6	05/06/15 WELL-6	11/22/16 WELL-6	11/14/17 WELL-6
Volatile Organics								
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
1,1,2,2-Tetrachloroethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	200 U [200 U]	200 U [200 U]	1,000 U [1,000]	100 U [100 U]	200 U	NA
1,1,2-Trichloroethane	0.19	µg/L	200 U [200 U]	200 U [200 U]	110 [110]	10 U [10 U]	50 U	14
1,1-Dichloroethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
1,1-Dichloroethene	4	µg/L	200 U [200 U]	200 U [200 U]	170 [200]	20 [18]	50 U	13
1,2,4-Trichlorobenzene	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 U [50 U]	50 U	5.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 UJ [50 UJ]	200 U	10 U
1,2-Dibromoethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
1,2-Dichlorobenzene	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 U [50 U]	100 U	5.0 U
1,2-Dichloroethane	--	µg/L	200 U [200 U]	200 U [200 U]	50 J [100 U]	10 U [10 U]	50 U	3.0 J
1,2-Dichloropropane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
1,3-Dichlorobenzene	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 U [50 U]	100 U	5.0 U
1,4-Dichlorobenzene	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 U [50 U]	100 U	5.0 U
2-Butanone	--	µg/L	200 U [200 U]	200 U [200 U]	1,000 UJ	100 U [100 U]	300 U	15 U
2-Hexanone	--	µg/L	200 U [200 U]	200 U [200 U]	1,000 U [1,000]	100 U [100 U]	300 U	15 U
4-Methyl-2-pentanone	--	µg/L	200 U [200 U]	200 U [200 U]	1,000 U [1,000]	100 U [100 U]	300 U	15 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	Well 6					
			05/04/12 WELL-6	05/02/13 Well-6	04/23/14 WELL-6	05/06/15 WELL-6	11/22/16 WELL-6	11/14/17 WELL-6
Volatile Organics								
Acetone	3,700	µg/L	200 U [200 U]	200 U [200 U]	2,000 UJ	200 U [200 U]	600 U	30 U
Benzene	0.4	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Bromodichloromethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Bromoform	--	µg/L	200 U [200 U]	200 U [200 U]	400 U [400 U]	40 U [40 U]	50 U	3.0 U
Bromomethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Carbon Disulfide	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 U [50 U]	100 U	5.0 U
Carbon Tetrachloride	0.16	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Chlorobenzene	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Chloroethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Chloroform	0.15	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Chloromethane	2	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
cis-1,2-Dichloroethene	40	µg/L	5,300 D [5,500 D]	2,000 [2,100]	62,000 D [65,000 D]	4,500 D [4,400 D]	12,000	3,100
cis-1,3-Dichloropropene	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Cyclohexane	--	µg/L	200 U [200 U]	200 U [200 U]	500 UJ [500 UJ]	50 U [50 U]	200 U	10 U
Dibromochloromethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U

TABLE 6

DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	Well 6					
			05/04/12 WELL-6	05/02/13 Well-6	04/23/14 WELL-6	05/06/15 WELL-6	11/22/16 WELL-6	11/14/17 WELL-6
Volatile Organics								
Dichlorodifluoromethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 <i>U</i>
Ethylbenzene	700	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Isopropylbenzene	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 U [50 U]	100 U	5.0 U
Methyl Acetate	--	µg/L	200 U [200 U]	200 U [200 U]	500 <i>U</i> [500]	50 U [50 U]	100 U	5.0 U
Methyl tert-butyl ether	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Methylcyclohexane	--	µg/L	200 U [200 U]	200 U [200 U]	500 <i>U</i> [500]	50 U [50 U]	100 U	5.0 U
Methylene Chloride	--	µg/L	200 U [200 U]	200 U [200 U]	300 U [300 U]	40 U [40 U]	200 U	3.0 U
Styrene	--	µg/L	200 U [200 U]	200 U [200 U]	500 U [500 U]	50 U [50 U]	100 U	5.0 U
Tetrachloroethene	1.1	µg/L	61 J [60 J]	36 J [46 J]	580 [600]	61 [56]	62 J	50
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	200 U [200 U]	200 U [200 U]	100 [110]	6.0 J [6.0 J]	50 U	8.0
trans-1,2-Dichloroethene	50	µg/L	39 J [34 J]	200 U [200 U]	180 [220]	25 [24]	70 J	21
trans-1,3-Dichloropropene	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Trichloroethene	1.6	µg/L	26,000 D	11,000 D	140,000 D	18,000 D	66,000	20,000
Trichlorofluoromethane	--	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3.0 U
Vinyl Chloride	0.019	µg/L	52 J [49 J]	200 U [200 U]	610 [760]	42 [42]	460	37
Xylenes (total)	4,000	µg/L	200 U [200 U]	200 U [200 U]	100 U [100 U]	10 U [10 U]	50 U	3 J
Inorganics								
Arsenic	0.045	µg/L	10.0 U [10.0]	10.0 U [10.0]	6.80 U [6.80]	7.20 U [7.20]	9.7 U	9.6 U
Ferrous Iron	300	µg/L	1.5 [1.5]	1,100 [1,100]	9,800 J	300 [280]	48,700	25,500
Lead	5	µg/L	4.60 [4.20]	3.00 U [3.00]	4.70 U [4.70]	4.70 U [4.70]	6.2 U	8.0 <i>J B</i>
Manganese	50	µg/L	37.9 [39.4]	25.2 [23.3]	369 [358]	13.4 [13.2]	783	447

TABLE 6								
DETECTED CONSTITUENTS IN GROUNDWATER - INSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	Well 6					
			05/04/12 WELL-6	05/02/13 Well-6	04/23/14 WELL-6	05/06/15 WELL-6	11/22/16 WELL-6	11/14/17 WELL-6
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U [10.0 U]	10.0 U [10.0 U]	6.80 U [6.80 U]	7.20 U [7.20 U]	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.36 [0.39]	19.0 J [10.0 U]	70.0 J [9,700 J]	87.0 [75.0]	47,000	21,900
Lead	5	µg/L	10.0 UB [10.0 UB]	3.00 U [3.00 U]	4.70 U [4.70 U]	4.70 U [4.70 U]	6.2 U	6.0 U
Manganese	50	µg/L	30.2 [29.5]	18.0 [17.8]	363 [368]	12.0 [11.9]	708	408
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	118 [119]	102 [103]	62.9 [64.6]	80.5 [81.2]	107	109 J
Alkalinity to pH 8.3	--	mg/L	0.7 U [0.7 U]	2 UJ [4.1 J]	2 U [2 U]	2 U [2 U]	1.7 U	1.7 U
Chloride	250	mg/L	21.9 [21.7]	10.1 [10]	89.6 [101]	25 [17.3]	45.8	15.1
Nitrate Nitrogen	--	mg/L	0.5 U [0.5 U]	0.5 U [0.5 U]	0.5 U [0.5 U]	0.5 U [0.5 U]	0.25 U	0.25 U
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	10.6 [10.6]	19.5 [19.4]	5 U [1.6 J]	9.2 [9.5]	24.6	11.2
Total Organic Carbon	--	mg/L	1.7 [1.6]	0.92 J [0.95 J]	10.3 [10.1]	1.7 [1.6]	3.8	0.79 J
Gases								
Carbon Dioxide	--	µg/L	12,000 U [12,000 U]	12,000 U [12,000 U]	14,000 [13,000]	12,000 U [12,000 U]	89,000	43,000
Ethane	--	µg/L	160 [170]	71 [81]	1,900 D [1,900 D]	230 [220]	70	25
Ethene	--	µg/L	120 [130]	46 [52]	1,200 D [1,200 D]	150 [140]	66	16
Methane	--	µg/L	48 [51]	11 [13]	370 [450]	32 [30]	400	16

Notes:

- a) Groundwater Cleanup Standards (GCS) set forth by the Record of Decision (ROD) that was issued by the USEPA on September 30, 1999.
- b) "--" indicates that a GCS is not listed for the associated groundwater parameter.
- c) "µg/L" micrograms per liter.
- d) "mg/L" milligrams per liter.
- e) "xx[xx]" indicates a duplicate sample was collected at this location during the sampling event.

f) Data Qualifiers:

"B" indicates an estimated value between the instrument detection limit and the Reporting Limit (RL).

"B " This result should be considered non-detected because it was detected in the laboratory and/or equipment blank at a similar level.

"J" indicates an estimated value.

"J" The associated value is an estimated quantity.

"J+ " indicates analyte is present. The reported value may be biased high. The actual value is expected to be lower than reported.

"J- " The analyte is present. The reported value may be biased low. The actual value is expected to be higher than reported.

"R" indicates the sample results are rejected.

"U" indicates the compound was analyzed for but not detected. The associated value is the compound quantitation limit.

"UB" indicates that the compound is considered non-detect at the listed value due to associated blank contamination.

"UJ" indicates the compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

"UJ " This analyte was analyzed for, but was not detected. The associated reporting limit is an estimate and may be inaccurate or imprecise.

"D" indicates the compound concentration is based on a diluted sample analysis.

"JB" indicates that the result is considered an estimate at the listed value due to associated blank contamination.

g) "BOLDED" values indicate that the associated groundwater parameter is detected within the sample.

h) "Shaded" cells indicate an exceedance of the associated GCS for the analytical param

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-2					
			05/02/12 MW-2	04/30/13 MW-2	04/22/14 MW-2	05/05/15 MW-2	11/23/16 MW-2	11/14/17 MW-2
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U ^(e)	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-2					
			05/02/12 MW-2	04/30/13 MW-2	04/22/14 MW-2	05/05/15 MW-2	11/23/16 MW-2	11/14/17 MW-2
Volatile Organics								
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 U	20 U	6.0 U	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-2					
			05/02/12 MW-2	04/30/13 MW-2	04/22/14 MW-2	05/05/15 MW-2	11/23/16 MW-2	11/14/17 MW-2
Volatile Organics								
Chloroform	0.15	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U	10 U	0.50 J	1.0 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-2					
			05/02/12 MW-2	04/30/13 MW-2	04/22/14 MW-2	05/05/15 MW-2	11/23/16 MW-2	11/14/17 MW-2
Volatile Organics								
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	10 U	10 U	0.90 J	0.70 J^(b)	0.8 J	0.5 U
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA(h)	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,2- Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,3- Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	16	22	24	13 (g)	16	8.0
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0	1.0	1.0	0.9 J
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-2					
			05/02/12 MW-2	04/30/13 MW-2	04/22/14 MW-2	05/05/15 MW-2	11/23/16 MW-2	11/14/17 MW-2
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 UB	110	80.0 J	710	25 J	15 U
Lead	5	µg/L	5.00	3.00 U	4.70 U	12.8 J	6.2 U	6.0 U
Manganese	50	µg/L	12.7 B	33.5	64.7	305	63.4	48.6
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 UJ	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	NA	110	120 J	390	15 U	15 U
Lead	5	µg/L	3.00 U	4.00	4.70 U	4.70 U	6.2 U	6.0 U
Manganese	50	µg/L	9.80 B	25.3	33.9	45.7	30.3	29.6

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-2					
			05/02/12 MW-2	04/30/13 MW-2	04/22/14 MW-2	05/05/15 MW-2	11/23/16 MW-2	11/14/17 MW-2
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	27.9	14.2	13.6	15.3	14.3	10.3 J
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U
Chloride	250	mg/L	66.2	62.5	56.5	61.1	57.2	65.6 J+
Nitrate Nitrogen	--	mg/L	5.3	10.7	11.3	12.5	15.9	17.2 J+
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	2.4 J	5 U	5 U	5 U	10.4	1.5 U
Total Organic Carbon	--	mg/L	0.77 J	1 U	1 UB	1 U	0.50 U	0.50 U
Gases								
Carbon Dioxide	--	µg/L	60,000	100,000	100,000	95,000	130,000	110,000
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U	3.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-3					
			05/02/12 MW-3	04/30/13 MW-3	04/22/14 MW-3	05/05/15 MW-3	11/22/16 MW-3	11/15/17 MW-3
Volatile Organics								
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U] ⁽ⁱ⁾	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U [2.0 U]	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U [2.0 U]	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-3					
			05/02/12 MW-3	04/30/13 MW-3	04/22/14 MW-3	05/05/15 MW-3	11/22/16 MW-3	11/15/17 MW-3
Volatile Organics								
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U [3.0 U]	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U [3.0 U]	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U [3.0 U]	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 U	20 U	6.0 U [6.0 U]	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U [0.5 U]	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-3					
			05/02/12 MW-3	04/30/13 MW-3	04/22/14 MW-3	05/05/15 MW-3	11/22/16 MW-3	11/15/17 MW-3
Volatile Organics								
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Chloroform	0.15	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
cis-1,2-Dichloroethene	40	µg/L	10 U	10 U	1.0	0.9 J	0.9 J [0.8 J]	0.5 U
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U [2.0 U]	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U

TABLE 7

**DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE
FORMER RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-3					
			05/02/12 MW-3	04/30/13 MW-3	04/22/14 MW-3	05/05/15 MW-3	11/22/16 MW-3	11/15/17 MW-3
Volatile Organics								
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U [2.0 U]	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Tetrachloroethene	1.1	µg/L	3.0 J	3.0 J	5.0	3.0	1.0 [1.0]	2.0
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Trichloroethene	1.6	µg/L	17	11	17 UB	10	6.0 [7.0]	7.0
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE								
FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-3					
			05/02/12 MW-3	04/30/13 MW-3	04/22/14 MW-3	05/05/15 MW-3	11/22/16 MW-3	11/15/17 MW-3
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U [9.7 U]	9.6 U
Ferrous Iron	300	µg/L	0.1 UB	190	78.0 J	17.0 J	130 [72]	15 U
Lead	5	µg/L	3.00 U	3.20	4.70 U	4.70 U	6.2 U [6.2 U]	6.0 U
Manganese	50	µg/L	10.6 B	40.5	.00500 U	11.1	67.8 [70.8]	130
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 UJ	7.20 U	9.7 U [9.7 U]	9.6 U
Ferrous Iron	300	µg/L	0.053 J	200	70.0 J	31.0 J	28.0 J [100]	22 J
Lead	5	µg/L	3.00 U	3.00 U	4.70 U	4.70 U	6.2 U [6.2 U]	6.0 U
Manganese	50	µg/L	8.70 B	16.5	9.10	8.90	46.1 [44.3]	59.3 B

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-3					
			05/02/12 MW-3	04/30/13 MW-3	04/22/14 MW-3	05/05/15 MW-3	11/22/16 MW-3	11/15/17 MW-3
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	14.9	22.3	20.7	20.3	21.5 [21.1]	27.1
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U [1.7 U]	1.7 U
Chloride	250	mg/L	90.5	63.4	50.9	51.5	53.9 [52.8]	44.6 J+
Nitrate Nitrogen	--	mg/L	4.4	6.4	4.6	5.6	7.2 [8.1]	5.3
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	7	3.1 J	2 J	3.3 J	2.4 J [2.6 J]	3.3 J
Total Organic Carbon	--	mg/L	0.97 J	1 U	1 UB	1 U	0.50 U [0.50 U]	0.50 U
Gases								
Carbon Dioxide	--	µg/L	92,000	90,000	92,000	90,000	92,000 [88,000]	70,000
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U [1.0 U]	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	10 [11]	4.4 J

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5D						
			05/02/12 MW-5D	05/01/13 MW-5D	04/22/14 MW-5D	05/05/15 MW-5D	11/18/16 MW-5D	01/24/17 MW-5D	11/15/17 MW-5D
Volatile Organics									
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5D						
			05/02/12 MW-5D	05/01/13 MW-5D	04/22/14 MW-5D	05/05/15 MW-5D	11/18/16 MW-5D	01/24/17 MW-5D	11/15/17 MW-5D
Volatile Organics									
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	8.0 J	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 U	20 U	6.0 U	10.0 J	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	3.0 J	1.0 J	5.0	10	2.0	0.5 U	0.9 J

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5D						
			05/02/12 MW-5D	05/01/13 MW-5D	04/22/14 MW-5D	05/05/15 MW-5D	11/18/16 MW-5D	01/24/17 MW-5D	11/15/17 MW-5D
Volatile Organics									
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Chloroform	0.15	µg/L	5.0 J	3.0 J	10	31	3.0	10.0	2.0
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	2.0 J	10 U	3.0	4.0	2.0	1.0	2.0
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5D						
			05/02/12 MW-5D	05/01/13 MW-5D	04/22/14 MW-5D	05/05/15 MW-5D	11/18/16 MW-5D	01/24/17 MW-5D	11/15/17 MW-5D
Volatile Organics									
Methyl tert-butyl ether	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U	2.0 U	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	1.0 J	10 U	3.0	6.0	0.5 U	0.5 J	0.5 U
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	0.5 U	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	9.0 J	5.0 J	24	49	5.0	15.0	6.0
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5D						
			05/02/12 MW-5D	05/01/13 MW-5D	04/22/14 MW-5D	05/05/15 MW-5D	11/18/16 MW-5D	01/24/17 MW-5D	11/15/17 MW-5D
Inorganics									
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U [9.7 U]	NA	9.6 U
Ferrous Iron	300	µg/L	0.1 U	240	40.0 J	57.0	27 J [15 U]	NA	15 U
Lead	5	µg/L	3.00 U	10.4 J	4.70 U	4.70 U	6.2 U [6.2 U]	NA	6.0 U
Manganese	50	µg/L	1.10 B	81.8	0.00500 UB	7.5	7.4 [7.2]	NA	3.8 J
Inorganics, Dissolved									
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 UJ	7.20 U	9.7 U [9.7 U]	NA	9.6 U
Ferrous Iron	300	µg/L	0.1 U	10.0 U	51.0 J	10.0 U	42 J [55]	NA	15 U
Lead	5	µg/L	3.00 U	3.00 U	4.70 U	4.70 U	6.2 U [6.2 U]	NA	7.1 J
Manganese	50	µg/L	15.0 U	5.10 B	0.840 J	4.20 J	2.2 J [2.2 J]	NA	1.6 U
Miscellaneous									
Alkalinity to pH 4.5	--	mg/L ^(d)	107	85.5	99.7	110	106 [107]	NA	107
Alkalinity to pH 8.3	--	mg/L	22.1	2 U	2 U	2 U	1.7 U [1.7 U]	NA	1.7 U
Chloride	250	mg/L	19.3	90.7	187	270	16.9 [16.9]	25.3	12.9
Nitrate Nitrogen	--	mg/L	1.5	1.4	1.8	2.2	1.3 [1.3]	1.5	1.3 J+
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	0.25 U	NA
Sulfate	--	mg/L	17.8	10.8	15.4	15.5	17.1 [17.1]	22.3	17.1
Total Organic Carbon	--	mg/L	0.54 J	1 U	1 UB	0.59 J	0.50 U [0.50 U]	NA	0.50 U
Gases									
Carbon Dioxide	--	µg/L	12,000 U	12,000 U	12,000 U	12,000 U	4,900 J	4,700	4,000 U
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1 U	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U	3 U	3.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5S					
			05/02/12 MW-5S	05/01/13 MW-5S	04/22/14 MW-5S	05/05/15 MW-5S	11/17/16 MW-5S	11/15/17 MW-5S
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5S					
			05/02/12 MW-5S	05/01/13 MW-5S	04/22/14 MW-5S	05/05/15 MW-5S	11/17/16 MW-5S	11/15/17 MW-5S
Volatile Organics								
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 U	20 U	6.0 U	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5S					
			05/02/12 MW-5S	05/01/13 MW-5S	04/22/14 MW-5S	05/05/15 MW-5S	11/17/16 MW-5S	11/15/17 MW-5S
Volatile Organics								
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloroform	0.15	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5S					
			05/02/12 MW-5S	05/01/13 MW-5S	04/22/14 MW-5S	05/05/15 MW-5S	11/17/16 MW-5S	11/15/17 MW-5S
Volatile Organics								
Methyl tert-butyl ether	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	4.0 J	3.0 J	8.0	9.0	9.0	9.0
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	10 U	10 U	3.0 UB	0.60 J	0.5 U	1.0
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-5S					
			05/02/12 MW-5S	05/01/13 MW-5S	04/22/14 MW-5S	05/05/15 MW-5S	11/17/16 MW-5S	11/15/17 MW-5S
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 U	94.0 J	42.0 J	41.0 J	130	18 J
Lead	5	µg/L	3.10	5.50 J	4.70 U	4.70 U	6.2 U	6.0 U
Manganese	50	µg/L	64.2	137	69.5	157	57.1	39.1
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 UJ	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.019 J	73.0 J	90.0 J	25.0 J	50 J	23 J
Lead	5	µg/L	3.00 U	3.00 U	4.70 U	4.70 U	6.2 U	6.0 U
Manganese	50	µg/L	29.8	42.8	30.9	23.4	33.6 B	28.4 B
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L (d)	4.6	11.5	10	10.8	8.9	13.6
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U
Chloride	250	mg/L	128	124	135	108	131	90.2 J+
Nitrate Nitrogen	--	mg/L	3.7	3.7	3.6	3.7	3.4	3.3
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	46	40.7	34.2	35.8	47.6	38.5
Total Organic Carbon	--	mg/L	0.76 J	1 U	1.1 UB	1 U	0.50 U	0.50 U
Gases								
Carbon Dioxide	--	µg/L	180,000	180,000	160,000	140,000	160,000	150,000
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U	3.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-6					
			05/04/12 MW-6	05/03/13 MW-6	04/23/14 MW-6	05/06/15 MW-6	11/21/16 MW-6	11/16/17 MW-6
Volatile Organics								
1,1,1-Trichloroethane	-- (b)	µg/L ^(c)	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-6					
			05/04/12 MW-6	05/03/13 MW-6	04/23/14 MW-6	05/06/15 MW-6	11/21/16 MW-6	11/16/17 MW-6
2-Butanone	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	3.0 U	3.0 U
2-Hexanone	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U [10 U]	10 U [10 U]	10 U [10 U]	10 U [10 U]	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U [10 U]	10 U [10 U]	20 U [20 U]	20 U [20 U]	6.0 U	6.0 U
Benzene	0.4	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Bromoform	--	µg/L	10 U [10 U]	10 U [10 U]	4.0 U [4.0 U]	4.0 U [4.0 U]	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Chlorobenzene	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Chloroform	0.15	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE								
MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-6					
			05/04/12 MW-6	05/03/13 MW-6	04/23/14 MW-6	05/06/15 MW-6	11/21/16 MW-6	11/16/17 MW-6
Volatile Organics								
Chloromethane	2	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
cis-1,3-Dichloropropene	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-6					
			05/04/12 MW-6	05/03/13 MW-6	04/23/14 MW-6	05/06/15 MW-6	11/21/16 MW-6	11/16/17 MW-6
Volatile Organics								
Methylene Chloride	--	µg/L	10 U [10 U]	10 U [10 U]	3.0 U [3.0 U]	4.0 U [4.0 U]	2.0 U	0.5 U
Styrene	--	µg/L	10 U [10 U]	10 U [10 U]	5.0 U [5.0 U]	5.0 U [5.0 U]	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	10 U [10 U]	10 U [10 U]	3.0 UB [3.0 UB]	1.0 J [0.60 J]	0.5 U	1.0
Trichlorofluoromethane	--	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Vinyl Chloride	0.019	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U [10 U]	10 U [10 U]	1.0 U [1.0 U]	1.0 U [1.0 U]	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-6					
			05/04/12 MW-6	05/03/13 MW-6	04/23/14 MW-6	05/06/15 MW-6	11/21/16 MW-6	11/16/17 MW-6
Inorganics								
Arsenic	0.045	µg/L	10.0 U [10.0 U]	10.0 U [10.0 U]	6.80 U [6.80 U]	7.20 U [7.20 U]	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 U [0.1 U]	66.0 J [10.0 U]	R [32.0 J]	45.0 J [10.0 U]	58	15 U
Lead	5	µg/L	13.1 [12.9]	11.8 J [4.30 J]	4.70 U [4.70 U]	6.10 J [4.70 U]	6.2 U	6.0 U
Manganese	50	µg/L	32.4 [31.8]	39.9 [29.2]	37.0 [34.3]	39.9 [41.4]	39.4	222
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U [10.0 U]	10.0 UB [10.0 UB]	6.80 U [6.80 U]	7.20 U [7.20 U]	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 U [0.1 U]	10.0 U [10.0 U]	50.0 J [21.0 J]	14.0 J [27.0 J]	82	15 U
Lead	5	µg/L	10.0 UB [10.0 UB]	3.00 U [3.00 U]	4.70 U [4.70 U]	4.70 U [4.70 U]	6.2 U	6.0 U
Manganese	50	µg/L	4.80 B [4.70 B]	2.20 B [2.30 B]	4.00 J [4.00 J]	3.60 J [3.40 J]	6.2	12.9
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	193 [194]	192 [192]	192 [195]	185 [195]	168	190
Alkalinity to pH 8.3	--	mg/L	0.7 U [0.7 U]	2 U [2 U]	2 U [2 U]	2 U [2 U]	1.7 U	1.7 U
Chloride	250	mg/L	23.3 [22.9]	20.6 [20.7]	17.8 [18.5]	19.6 [19.3]	24.0	25.6 J+
Nitrate Nitrogen	--	mg/L	3.7 [3.7]	3.6 [3.8]	3.1 [3.2]	3.3 [3.2]	3.6	3.9 J+
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	15.5 [15.5]	15.2 [15.5]	13.5 [13.7]	14.9 [14.4]	15.0	14.3 J+
Total Organic Carbon	--	mg/L	1 U [1 U]	1 U [1 U]	1 [0.95 J]	1 U [1 U]	0.50 U	0.50 U
Gases								
Carbon Dioxide	--	µg/L	9,900 J [9,500 J]	9,600 J [11,000 J]	11,000 J [11,000 J]	12,000 J [10,000 J]	13,000	13,000
Ethane	--	µg/L	5 U [5 U]	5 U [5 U]	5 U [5 U]	5.0 U [5.0 U]	1.0 U	1.0 U
Ethene	--	µg/L	5 U [5 U]	5 U [5 U]	5 U [5 U]	5.0 U [5.0 U]	1.0 U	1.0 U
Methane	--	µg/L	15 U [15 U]	5 U [5 U]	5 U [5 U]	5.0 U [5.0 U]	3.0 U	3.0 U

TABLE 7

**DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE
MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-11D					
			05/04/12 MW-11D	05/02/13 MW-11D	04/24/14 MW-11D	05/07/15 MW-11D	11/23/16 MW-11D	11/14/17 MW-11D
Volatile Organics								
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2- trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 U	20 U	6.0 U	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-11D					
			05/04/12 MW-11D	05/02/13 MW-11D	04/24/14 MW-11D	05/07/15 MW-11D	11/23/16 MW-11D	11/14/17 MW-11D
Volatile Organics								
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 U	20 U	6.0 U	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloroform	0.15	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	20	5
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	3.0 J	2.0 J	7.0	5.0 UB	2.0	2.0
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-11D					
			05/04/12 MW-11D	05/02/13 MW-11D	04/24/14 MW-11D	05/07/15 MW-11D	11/23/16 MW-11D	11/14/17 MW-11D
Inorganics								
Arsenic	0.045	µg/L	3.50 B	10.0 U	6.80 U	8.50 J	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 U	10.0 U	R	22.0 J	15 U	15 U
Lead	5	µg/L	4.10	3.00 U	5.50 J	4.70 U	6.2 U	6.0 U
Manganese	50	µg/L	15.0 U	15.0 U	.00500 U	0.970 J	7.9	2.6 J
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 U	10.0 U	R	10.0 U	15 U	15 U
Lead	5	µg/L	10.0 UB	3.00 U	4.70 U	4.70 U	6.2 U	6.0 U
Manganese	50	µg/L	15.0 U	15.0 U	0.830 U	0.830 U	1.8 U	1.6 U
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	307	212	338	307	453	386 J
Alkalinity to pH 8.3	--	mg/L	288	208	331	287	435	363 J
Chloride	250	mg/L	44	39.9	44.7	104	74.4	67.3
Nitrate Nitrogen	--	mg/L	7.4	12.7	8.2	11.3	9.8	13.0
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	7.8	9.1	6.9	7.9	7.5	8.2
Total Organic Carbon	--	mg/L	1 U	1 U	0.89 J	0.6 J	0.50 U	0.50 U
Gases								
Carbon Dioxide	--	µg/L	12,000 U	12,000 U	12,000 U	12,000 U	4,000 U	4,000 U
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Methane	--	µg/L	5.3 J	5 U	5 U	5.0 U	3.0 U	3.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-11S					
			05/04/12 MW-11S	05/02/13 MW-11S	04/25/14 MW-11S	05/07/15 MW-11S	11/18/16 MW-11S	11/14/17 MW-11S
Volatile Organics								
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U [2.0 U]	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U [2.0 U]	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U [3.0 U]	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U [3.0 U]	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U [3.0 U]	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 U	20 U	6.0 U [6.0 U]	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U [0.5 U]	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-11S					
			05/04/12 MW-11S	05/02/13 MW-11S	04/25/14 MW-11S	05/07/15 MW-11S	11/18/16 MW-11S	11/14/17 MW-11S
Volatile Organics								
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Chloroform	0.15	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
cis-1,2-Dichloroethene	40	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U [2.0 U]	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methyl tert-butyl ether	--	µg/L	2.0 J	3.0 J	13	4.0	2.0 [2.0]	3.0
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U [2.0 U]	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U [1.0 U]	1.0 U
Tetrachloroethene	1.1	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Trichloroethene	1.6	µg/L	10 U	10 U	2.0 UB	1.0 UB	0.5 U [0.5 U]	0.7 J
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U [0.5 U]	0.5 U

TABLE 7

DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-11S					
			05/04/12 MW-11S	05/02/13 MW-11S	04/25/14 MW-11S	05/07/15 MW-11S	11/18/16 MW-11S	11/14/17 MW-11S
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U [9.7 U]	9.6 U
Ferrous Iron	300	µg/L	0.019 J	64.0 J	52.0 J	40.0 J	130 [110]	33 J
Lead	5	µg/L	10.1	5.00	6.10 J	4.70 U	6.2 U [6.2 U]	21.5 B
Manganese	50	µg/L	29.4	35.8	35.8	31.0	30.8 [29.8]	33.5
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U [9.7 U]	9.6 U
Ferrous Iron	300	µg/L	0.1 U	44.0 J	74.0 J	39.0 J	22.0 J [120]	15 U
Lead	5	µg/L	10.0 UB	3.00 U	6.20 J	4.70 U	6.2 U [6.2 U]	6.0 U
Manganese	50	µg/L	27.8	28.5	25.9	23.7	27.2 [26.0]	25.6
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	3.7	6	7.7	12.5	6.9 [6.5]	6.7 J
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U [1.7 U]	1.7 U
Chloride	250	mg/L	24.1	23.3	27.5	26.7	26.7 [26.5]	29.2
Nitrate Nitrogen	--	mg/L	23.1	23.1	21.3	22.6	22.9 [22.9]	21.7
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	5.4	5.1	2.2 J	3.3 J	9.7 [5.3]	3.4 J
Total Organic Carbon	--	mg/L	1 U	1 U	0.55 J	1 U	0.50 U [0.50 U]	0.50 U
Gases								
Carbon Dioxide	--	µg/L	89,000	92,000	85,000	80,000	99,000 [98,000]	83,000
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U [1.0 U]	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U [1.0 U]	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U [3.0 U]	3.0 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13D					
			05/03/12 MW-13D	05/02/13 MW-13D	04/24/14 MW-13D	05/07/15 MW-13D	11/17/16 MW-13D	11/15/17 MW-13D
Volatile Organics								
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 UJ	10 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 UJ	20 U	6.0 U	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	2.0	3.0
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13D					
			05/03/12 MW-13D	05/02/13 MW-13D	04/24/14 MW-13D	05/07/15 MW-13D	11/17/16 MW-13D	11/15/17 MW-13D
Volatile Organics								
Chloroform	0.15	µg/L	10 U	10 U	1.0 U	1.0 U	11	12
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	10 U	10 U	1.0 U	1.0 U	5.0	6.0
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	10 U	10 U	1.0 U	1.0 U	3.0	16
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	10 U	10 U	4.0 UB	1.0 UB	4.0	9.0
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U

TABLE 7								
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE								
EMMAUS, PENNSYLVANIA								
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13D					
			05/03/12 MW-13D	05/02/13 MW-13D	04/24/14 MW-13D	05/07/15 MW-13D	11/17/16 MW-13D	11/15/17 MW-13D
Inorganics								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 U	50.0 J	130 J	180	220	15 U
Lead	5	µg/L	8.80	4.90	11.6 J	17.3	28.1	6.0 U
Manganese	50	µg/L	14.0 B	15.9	60.2	100	229	42.8
Inorganics, Dissolved								
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U	9.6 U
Ferrous Iron	300	µg/L	0.1 U	32.0 J	130 J	210	15 U	15 U
Lead	5	µg/L	6.00 U	3.00 U	4.70 U	4.70 U	6.2 U	6.0 U
Manganese	50	µg/L	12.8 B	14.9 B	25.3	32.1	54.3	3.8 J B
Miscellaneous								
Alkalinity to pH 4.5	--	mg/L ^(d)	11.6	14	14.2	13.8	157	156
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	1.7 U
Chloride	250	mg/L	10.2	11.6	5.1	6.4	36.2	24.8
Nitrate Nitrogen	--	mg/L	5	4.9	4.8	4.9	3.8	3.2 J+
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	NA
Sulfate	--	mg/L	1.6 J	5 U	5 U	5 U	19.6	16.9
Total Organic Carbon	--	mg/L	1.4	1 U	0.74 J	1 U	1.1	0.50 U
Gases								
Carbon Dioxide	--	µg/L	75,000	76,000	73,000	68,000	7,700 J	9,900 J
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	59	7.6

TABLE 7									
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE									
MANUFACTURING SITE									
EMMAUS, PENNSYLVANIA									
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13I						
			05/03/12 MW-13I	05/02/13 MW-13I	04/24/14 MW-13I	05/07/15 MW-13I	11/17/16 MW-13I	01/24/17 MW-13I	11/15/17 MW-13I
Volatile Organics									
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2,4- Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	0.5 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 UJ	10 U	3.0 U	9.0 J	3.0 UJ
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U	3.0 UJ
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U	3.0 U
Acetone	3,700	µg/L	10 U	10 U	20 UJ	20 U	55	9.0 J	6.0 UJ
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U

TABLE 7									
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE									
EMMAUS, PENNSYLVANIA									
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13I						
			05/03/12 MW-13I	05/02/13 MW-13I	04/24/14 MW-13I	05/07/15 MW-13I	11/17/16 MW-13I	01/24/17 MW-13I	11/15/17 MW-13I
Volatile Organics									
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	4.0 J	4.0 J	5.0	6.0	7.0	8.0	5.0
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Chloroform	0.15	µg/L	2.0 J	2.0 J	3.0	3.0	4.0	3.0	3.0
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	2.0 J	2.0 J	4.0	3.0	5.0	5.0	5.0
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U	2.0 U	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	5.0 J	6.0 J	10	9.0	19	20.0	9.0
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	25	24	37	37	50	49.0	35
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U

TABLE 7									
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE FORMER RODALE MANUFACTURING SITE									
EMMAUS, PENNSYLVANIA									
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13I						
			05/03/12 MW-13I	05/02/13 MW-13I	04/24/14 MW-13I	05/07/15 MW-13I	11/17/16 MW-13I	01/24/17 MW-13I	11/15/17 MW-13I
Inorganics									
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	9.00 J	9.7 U	NA	9.6 U
Ferrous Iron	300	µg/L	0.1 U	32.0 J	84.0 J	64.0	57	NA	15 U
Lead	5	µg/L	3.00 U	4.00	4.70 U	4.70 U	6.2 U	NA	6.0 U
Manganese	50	µg/L	7.40 B	5.60 B	29.1	2.80 J	15.7	NA	11.6
Inorganics, Dissolved									
Arsenic	0.045	µg/L	4.60 B	10.0 U	6.80 U	7.20 U	9.7 U	NA	9.6 U
Ferrous Iron	300	µg/L	0.1 U	10.0 U	R	10.0 U	150	NA	15 U
Lead	5	µg/L	7.70	3.00 U	4.70 U	4.70 U	6.2 U	NA	6.0 U
Manganese	50	µg/L	15.0 U	2.10 B	0.00500 UB	0.830 U	1.8 U	NA	1.6 U
Miscellaneous									
Alkalinity to pH 4.5	--	mg/L ^(d)	93.8	98.9	96.7	96.7	101	NA	101
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U	NA	1.7 U
Chloride	250	mg/L	12.7 J	12.8	10.6	12	13.2	11.6	11.7 J+
Nitrate Nitrogen	--	mg/L	8.9	8.8	7.7	8.6	8.6	8.4	8.0
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	0.25 U	NA
Sulfate	--	mg/L	23.3	1.7 J	5 U	2.9 J	2.6 J	3.2 J	2.4 J
Total Organic Carbon	--	mg/L	1 U	1 U	0.68 J	1 U	0.50 U	NA	0.50 U
Gases									
Carbon Dioxide	--	µg/L	12,000 U	12,000 U	12,000 U	12,000 U	4,000 U	4,000 U	4,000 U
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1 U	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U	3 U	3.0 U

TABLE 7									
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE									
FORMER RODALE MANUFACTURING SITE									
EMMAUS, PENNSYLVANIA									
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13S						
			05/03/12 MW-13S	05/02/13 MW-13S	04/24/14 MW-13S	05/07/15 MW-13S	11/17/16 MW-13S	01/24/17 MW-13S	11/15/17 MW-13S
Volatile Organics									
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	10 U	10 U	10 U	10 U	2.0 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	10 U	10 U	5.0 U	5.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	10 U	10 U	10 UJ	10 U	3.0 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	10 U	10 U	10 U	10 U	3.0 U	3.0 U	3.0 U

TABLE 7									
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE									
FORMER RODALE MANUFACTURING SITE									
EMMAUS, PENNSYLVANIA									
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13S						
			05/03/12 MW-13S	05/02/13 MW-13S	04/24/14 MW-13S	05/07/15 MW-13S	11/17/16 MW-13S	01/24/17 MW-13S	11/15/17 MW-13S
Volatile Organics									
Acetone	3,700	µg/L	10 U	10 U	20 UJ	20 U	6.0 U	6.0 U	6.0 U
Benzene	0.4	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Bromoform	--	µg/L	10 U	10 U	4.0 U	4.0 U	0.5 U	0.5 U	0.5 U
Bromomethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.7 J	0.5 U
Chlorobenzene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Chloroethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Chloroform	0.15	µg/L	10 U	10 U	0.50 J	0.70 J	0.6 J	0.7 J	0.7 J
Chloromethane	2	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	6.0 J	3.0 J	6.0	4.0	4.0	6	5.0
cis-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	2.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U

TABLE 7

**DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE
FORMER RODALE MANUFACTURING SITE**

EMMAUS, PENNSYLVANIA

Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13S						
			05/03/12 MW-13S	05/02/13 MW-13S	04/24/14 MW-13S	05/07/15 MW-13S	11/17/16 MW-13S	01/24/17 MW-13S	11/15/17 MW-13S
Volatile Organics									
Dichlorodifluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	10 U	10 U	5.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	10 U	10 U	3.0 U	4.0 U	2.0 U	2.0 U	0.5 U
Styrene	--	µg/L	10 U	10 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	6.0 J	3.0 J	6.0	5.0	2.0	10	4.0
Tetrahydrofuran	--	µg/L	NA	NA	NA	NA	NA	NA	NA
Toluene	380	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	15	8.0 J	22	14	8	18	12.0
Trichlorofluoromethane	--	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	0.019	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	10 U	10 U	1.0 U	1.0 U	0.5 U	0.5 U	0.5 U

TABLE 7									
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE									
FORMER RODALE MANUFACTURING SITE									
EMMAUS, PENNSYLVANIA									
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-13S						
			05/03/12 MW-13S	05/02/13 MW-13S	04/24/14 MW-13S	05/07/15 MW-13S	11/17/16 MW-13S	01/24/17 MW-13S	11/15/17 MW-13S
Inorganics									
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.30 J	9.7 U [9.7 U]	NA	9.6 U
Ferrous Iron	300	µg/L	0.1 U	31.0 J	17.0 J	24.0 J	140 [92]	NA	15 U
Lead	5	µg/L	6.00 U	3.70	4.70 U	4.70 U	6.2 U [6.2 U]	NA	6.0 U
Manganese	50	µg/L	35.1	28.4	1,250	4,430	808 [859]	NA	1,100
Inorganics, Dissolved									
Arsenic	0.045	µg/L	10.0 U	10.0 U	6.80 U	7.20 U	9.7 U [9.7 U]	NA	9.6 U
Ferrous Iron	300	µg/L	0.1 U	11.0 J	R	10.0 U	18 J [26 J]	NA	15 U
Lead	5	µg/L	8.50	3.00 U	4.70 U	4.70 U	6.2 U [6.2 U]	NA	6.4 J
Manganese	50	µg/L	28.5	10.2 B	22.7	6.50	12.4 B [13.0 B]	NA	5.8 B
Miscellaneous									
Alkalinity to pH 4.5	--	mg/L ^(d)	171	175	185	180	187 [187]	NA	188
Alkalinity to pH 8.3	--	mg/L	0.7 U	2 U	2 U	2 U	1.7 U [1.7 U]	NA	1.7 U
Chloride	250	mg/L	7.5	6.4	7	7.5	9.4 [9.6]	9.4	9.2
Nitrate Nitrogen	--	mg/L	4.4	4.7	3.9	4.3	4.1 [4.1]	3.9	3.9 J+
Nitrite Nitrogen	10	mg/L	NA	NA	NA	NA	NA	0.25 U	NA
Sulfate	--	mg/L	2.1 J	5 U	5 U	5 U	1.5 U [1.5 U]	8.1	2.7 J
Total Organic Carbon	--	mg/L	1 U	1 U	0.98 J	1 U	0.50 U [0.50 U]	NA	0.50 U
Gases									
Carbon Dioxide	--	µg/L	13,000	14,000	14,000	13,000	15,000	15,000	17,000
Ethane	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1 U	1.0 U
Ethene	--	µg/L	5 U	5 U	5 U	5.0 U	1.0 U	1 U	1.0 U
Methane	--	µg/L	15 U	5 U	5 U	5.0 U	3.0 U	3 U	3.0 U

TABLE 7					
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE					
FORMER RODALE MANUFACTURING SITE					
EMMAUS, PENNSYLVANIA					
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-14D		
			11/17/16 MW-14D	01/25/17 MW-14D	11/14/17 MW-14D
Volatile Organics					
1,1,1-Trichloroethane	.. (b)	µg/L ^(c)	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	--	µg/L	0.5 U	0.5 U	0.5 U
1,1,2-trichloro-1,2,2-trifluoroethane	--	µg/L	2.0 U	2.0 U	NA
1,1,2-Trichloroethane	0.19	µg/L	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	--	µg/L	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	4	µg/L	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	--	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane	--	µg/L	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane	--	µg/L	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	--	µg/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	--	µg/L	0.6 J	0.5 U	0.5 J
1,2-Dichloropropane	--	µg/L	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	--	µg/L	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	--	µg/L	1.0 U	1.0 U	1.0 U
2-Butanone	--	µg/L	3.0 U	3.0 U	3.0 U
2-Hexanone	--	µg/L	3.0 U	3.0 U	3.0 U
4-Methyl-2-pentanone	--	µg/L	3.0 U	3.0 U	3.0 U
Acetone	3,700	µg/L	6.0 U	6.0 U	6.0 U

TABLE 7					
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE					
FORMER RODALE MANUFACTURING SITE					
EMMAUS, PENNSYLVANIA					
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-14D		
			11/17/16 MW-14D	01/25/17 MW-14D	11/14/17 MW-14D
Volatile Organics					
Benzene	0.4	µg/L	0.5 U	0.5 U	0.5 U
Bromodichloromethane	--	µg/L	0.5 U	0.5 U	0.5 U
Bromoform	--	µg/L	0.5 U	0.5 U	0.5 U
Bromomethane	--	µg/L	0.5 U	0.5 U	0.5 U
Carbon Disulfide	--	µg/L	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	0.16	µg/L	15	20	11
Chlorobenzene	--	µg/L	0.5 U	0.5 U	0.5 U
Chloroethane	--	µg/L	0.5 U	0.5 U	0.5 U
Chloroform	0.15	µg/L	3.0	4.0	3.0
Chloromethane	2	µg/L	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	40	µg/L	4.0	5.0	5.0
cis-1,3-Dichloropropene	--	µg/L	0.5 U	0.5 U	0.5 U
Cyclohexane	--	µg/L	2.0 U	2.0 U	2.0 U
Dibromochloromethane	--	µg/L	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	--	µg/L	0.5 U	0.5 U	0.5 U
Ethylbenzene	700	µg/L	0.5 U	0.5 U	0.5 U
Isopropylbenzene	--	µg/L	1.0 U	1.0 U	1.0 U
Methyl Acetate	--	µg/L	1.0 U	1.0 U	1.0 U
Methyl tert-butyl ether	--	µg/L	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	µg/L	1.0 U	1.0 U	1.0 U
Methylene Chloride	--	µg/L	2.0 U	2.0 U	0.5 U
Styrene	--	µg/L	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.1	µg/L	0.5 U	0.5 U	0.5 U
Tetrahydrofuran	--	µg/L	NA	NA	NA
Toluene	380	µg/L	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	50	µg/L	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	--	µg/L	0.5 U	0.5 U	0.5 U
Trichloroethene	1.6	µg/L	120	170	110
Trichlorofluoromethane	--	µg/L	0.5 U	1.0	0.5 U
Vinyl Chloride	0.019	µg/L	0.5 U	0.5 U	0.5 U
Xylenes (total)	4,000	µg/L	0.5 U	0.5 U	0.5 U

TABLE 7					
DETECTED CONSTITUENTS IN GROUNDWATER - OUTSIDE THE PROBABLE DNAPL ZONE					
FORMER RODALE MANUFACTURING SITE					
EMMAUS, PENNSYLVANIA					
Location ID: Date Collected: Sample Name:	Groundwater Cleanup Standards ^(a)	Units	MW-14D		
			11/17/16 MW-14D	01/25/17 MW-14D	11/14/17 MW-14D
Inorganics					
Arsenic	0.045	µg/L	9.7 U	NA	9.6 U
Ferrous Iron	300	µg/L	360	NA	89
Lead	5	µg/L	6.2 U	NA	6.0 U
Manganese	50	µg/L	139	NA	218
Inorganics, Dissolved					
Arsenic	0.045	µg/L	9.7 U	NA	9.6 U
Ferrous Iron	300	µg/L	25 J	NA	15 U
Lead	5	µg/L	6.2 U	NA	6.0 U
Manganese	50	µg/L	3.3 J	NA	1.6 U
Miscellaneous					
Alkalinity to pH 4.5	--	mg/L ^(d)	83.6	NA	82.7 J
Alkalinity to pH 8.3	--	mg/L	1.7 U	NA	1.7 U
Chloride	250	mg/L	13.4	NA	13.4 J+
Nitrate Nitrogen	--	mg/L	3.4	NA	3.1 J+
Nitrite Nitrogen	10	mg/L	NA	NA	NA
Sulfate	--	mg/L	9.1	NA	8.6 J+
Total Organic Carbon	--	mg/L	0.50 U	NA	0.50 U
Gases					
Carbon Dioxide	--	µg/L	4,000 U	NA	4,000 U
Ethane	--	µg/L	1.0 U	NA	1.0 U
Ethene	--	µg/L	1.0 U	NA	1.0 U
Methane	--	µg/L	3.0 U	NA	3.0 U

TABLE 8
MANN-KENDALL TREND SUMMARY
FORMER RODALE MANUFACTURING SITE
EMMAUS, PENNSYLVANIA

Well I.D.	Parameter	Trend ^(a)
<i>Wells Inside TI Waiver Area</i>		
EXW-1	Trichloroethene	Decreasing, significant
	Vinyl chloride	Decreasing, not significant
EXW-2	Tetrachloroethene	Increasing, not significant
	Trichloroethene	Decreasing, not significant
	cis-1,2-Dichloroethene	Decreasing, not significant
	Vinyl chloride	No trend
EXW-3R ^(b)	Tetrachloroethene	Increasing, not significant
	Trichloroethene	Decreasing, not significant
	cis-1,2-Dichloroethene	Decreasing, significant
	Vinyl chloride	Decreasing, not significant
EXW-4	Tetrachloroethene	Increasing, not significant
	Trichloroethene	Increasing, significant
	cis-1,2-Dichloroethene	Increasing, significant
	Vinyl chloride	Decreasing, not significant
MW-1	Tetrachloroethene	Decreasing, not significant
	Trichloroethene	Decreasing, significant
	cis-1,2-Dichloroethene	Decreasing, significant
MW-4	Tetrachloroethene	Decreasing, not significant
	Trichloroethene	Decreasing, significant
Well 6	Tetrachloroethene	Increasing, significant ^(c)
	Trichloroethene	Increasing, significant ^(c)
	cis-1,2-Dichloroethene	Increasing, not significant
	Vinyl chloride	Increasing, not significant
<i>Wells Outside TI Waiver Area</i>		
MW-2	Trichloroethene	Decreasing, not significant
MW-3	Trichloroethene	Decreasing, significant
MW-5D	Tetrachloroethene	Decreasing, not significant
	Trichloroethene	Increasing, significant ^(c)
MW-10I	Trichloroethene	Increasing, significant ^(c)
MW-10D	Trichloroethene	Decreasing, not significant
MW-13S	Trichloroethene	Increasing, not significant
MW-13I	Tetrachloroethene	Increasing, significant ^(c)
	Trichloroethene	Increasing, significant ^(c)
MW-13D	Trichloroethene	Decreasing, significant

Notes:

^(a) Statistical analysis run using the ChemStat v. 6.3, copyright 1996-2010 by Starpoint Software.

Trend type and significance are determined by the Mann-Kendall test; significance is determined using a 95 percent confidence interval.

^(b) Recovery well RW-3R was abandoned on 8/3/16 and was replaced with recovery well EXW-3R, EXW-3R data will be used in MK analysis continuing forward.

^(c) Half the detection limit was used for non-detect values. Non-detect values with no known detection limit were not included.