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GROUNDWATER EXTRACTION AND TREATMENT SYSTEM ANNUAL OPERATIONS REPORT FOR THE PERIOD JANUARY 1 THROUGH DECEMBER 31, 2019 FORMER YORK NAVAL ORDNANCE PLANT

Prepared for:

former York Naval Ordnance Plant Remediation Team

March 2020

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Groundwater Extraction and Treatment System
Annual Operations Report
for the Period
January 1 through December 31, 2019
Former York Naval Ordnance Plant

Prepared for:

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By:

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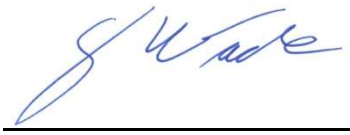
March 2020

Respectfully submitted,



Emily M. Wade
Project Environmental Scientist

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Senior Program Manager

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1,1-DCE	-	1,1-dichloroethene
cfm	-	cubic feet per minute
cis-1,2-DCE	-	cis-1,2-dichloroethene
EPA	-	United States Environmental Protection Agency
fYNOP	-	former York Naval Ordnance Plant
GAC	-	granular-activated carbon
gpd	-	gallons per day
gpm	-	gallons per minute
GSC	-	Groundwater Sciences Corporation
GWTS	-	groundwater extraction and treatment system
Harley-Davidson	-	Harley-Davidson Motor Company Operations, Inc.
HDPE	-	high density polyethylene
HTG	-	Hydro-Terra Group
lbs/day	-	pounds per day
NB4	-	North Building 4
NPBA	-	Northeast Property Boundary Area
NPDES	-	National Pollutant Discharge Elimination System
NP York	-	NP York 58, LLC
O&M	-	operation and maintenance
PADEP	-	Pennsylvania Department of Environmental Protection
PCE	-	tetrachloroethene
PLC	-	programmable logic controller
ppm	-	parts per million
PTA	-	packed tower aerator
SPBA	-	Southern Property Boundary Area
SRBC	-	Susquehanna River Basin Commission
TCA	-	1,1,1-trichloroethane
TCE	-	trichloroethene
µg/L	-	micrograms per liter
VFD	-	variable frequency drive
VOCs	-	volatile organic compounds
WPL	-	West Parking Lot

EXECUTIVE SUMMARY

This report presents a summary of the groundwater extraction and treatment system (GWTS) operations and maintenance (O&M) and groundwater extraction well monitoring during 2019 at the former York Naval Ordnance Plant (fYNOP). The fYNOP-GWTS is located at the Harley-Davidson Motor Company Operations, Inc. (Harley-Davidson) facility in York, Pennsylvania. The fYNOP-GWTS and has been in operation for over 29 years (since November 1990) and consists of numerous collection wells in three areas (the West Parking Lot (WPL), Northeast Property Boundary Area (NPBA), and Southern Property Boundary Area (SPBA)) of fYNOP.

Completion of post-shut down monitoring was approved for the NPBA in early 2019, and only the WPL and SPBA collection wells (CW-9, CW-13, CW-15A, CW-17, CW-20, CW-21, CW-22, and CW-23) were operational during 2019. The NPBA collection wells were shut down in mid-2013 in accordance with a work plan approved by the United States Environmental Protection Agency (EPA) and Pennsylvania Department of Environmental Protection (PADEP), and, following five years of post-shutdown monitoring, are no longer required to be operational.

Approximately 821 pounds of volatile organic compounds (VOCs) were removed by the GWTS during 2019. The total amount of groundwater extracted during 2019 was approximately 127 million gallons. Cumulatively, approximately 48,018 pounds of VOCs have been removed by the GWTS since 1990.

Site-wide groundwater elevation and sampling data were collected in September 2019. These data, along with laboratory analytical data, will be presented in the 2019 fYNOP Annual Groundwater Quality Report (in preparation by Groundwater Sciences Corporation [GSC]).

1.0 INTRODUCTION

This report presents a summary of the operating record for the fYNOP GWTS and includes collection well water quality data obtained during 2019. The fYNOP facility consists of the current Harley-Davidson York facility and the West Campus property (as described below). The fYNOP is located in Springettsbury Township, York County, Pennsylvania, as shown on **Figure 1-1**. This report covers the 12-month period from January 1 through December 31, 2019. Hydro-Terra Group (HTG) operated the GWTS during the reporting period.

Harley-Davidson sold 58 acres of the western portion of the fYNOP in June 2012. NP York 58, LLC (NP York) constructed a 755,000 square-foot warehouse in 2016. The parcel—now addressed as 1445 Eden Road, York, Pennsylvania —extends from west of the current manufacturing operations through the WPL and is identified as the "West Campus". The fYNOP retains responsibility for the cleanup of the West Campus and maintains an easement agreement with the owners to continue remediation, monitoring, and maintenance activities.

The GWTS consists of a groundwater treatment plant, a groundwater extraction system, and a force main discharge system. Collectively, the fYNOP GWTS was designed to extract and treat groundwater containing VOCs of concern that consist of trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (TCA), and their degradation products, including cis-1,2-dichloroethene (cis-1,2-DCE) and 1,1-dichloroethene (1,1-DCE).

During 2019, groundwater was extracted from nine (9) pumping wells (CW-9, CW-13, CW-15A, CW-17, CW-19, CW-20, CW-21, CW-22, and CW-23) operating in two (2) separate areas designated as the WPL Area (which includes the former North Building 4 [NB4] Area) and the SPBA. The collection systems are shown on **Figure 1-2**. WPL collection wells (CW-9, CW-13, CW-15A, CW-17, and CW-20) were all operational during 2019. The SPBA collection wells (CW-21, CW-22, and CW-23) were functional in 2019. The SPBA extraction system was designed to capture and control shallow groundwater containing TCE and PCE.

The NPBA collection wells, that were shut down in mid-2013 in accordance with the approved work plan, had pump assemblies removed in May 2019. Future monitoring activities in the NPBA will be conducted in accordance with a Post-Remediation Care Plan (GSC, 2019a).

Other groundwater extraction areas previously shutdown and abandoned included the former TCA Tank Area, within former Building 2 and a former Lift Station and collection well CW-19 at Building 3.

All extracted groundwater is piped to the groundwater treatment building (Building 41A) for processing through a packed tower aerator (PTA) prior to discharge to the Codorus Creek, designated as Outfall No. 003 (see **Figures 1-1** and **1-2**).

Figure 1-3 presents a schematic flow diagram for this treatment system. A chemical sequestering agent (Redux 525) injection system was installed in June 2010 to reduce mineral fouling of the GWTS PTA, effluent discharge pumps, and components. This sequestrant chemical injection system continued to operate throughout 2019. PTA off-gases are treated by a vapor phase, granular-activated carbon (GAC) filter system for removal of VOCsprior to emitting to the atmosphere.

Treated groundwater is collected in a wet well pump station located immediately northwest of Building 41A and pumped from the wet well through an 8-inch diameter force main, approximately 1,600 feet, to Outfall 003 near the confluence of Johnsons Run and Codorus Creek (refer to **Figure 1-2**).

The treatment system operates and discharges under a National Pollutant Discharge Elimination System (NPDES) permit No. PA0085677 issued by PADEP. The previous permit was issued on November 22, 2010 and expired on November 30, 2015. Harley-Davidson submitted the renewal application in May 2015 in accordance with the PADEP guidelines. A permit was issued by PADEP in late 2019, with an effective date of December 1, 2019 through November 20, 2024.

2.0 GEOLOGY AND HYDROGEOLOGY

Two geologic rock formations underlie the site. Solution-prone (karst) gray carbonate bedrock (limestone and dolostone) underlies the flat lowland (western) portion of the site (i.e. the WPL extraction area). Quartzitic sandstone underlies the more steeply sloping hills or upland area present on the eastern part of the site (which includes the NPBA groundwater collection area). The SPBA extraction area lies near a contact between the quartzitic sandstone and limestone geologic formations. Natural groundwater flow is generally westward, from the upland area at the eastern part of the site towards Codorus Creek. A detailed discussion of the geology and hydrogeology is included in the revised report entitled "Supplemental Remedial Investigation Groundwater Report (Part 2)." (GSC, 2018b).

3.0 SITE-WIDE GROUNDWATER AND SURFACE WATER MONITORING

The groundwater monitoring program at the fYNOP site in 2019 consisted of:

- Measuring depth to water in all available monitoring and observation wells one time.
- Sampling and chemical analysis of groundwater from the collection wells throughout the year (see results summary in **Table A-1 in Appendix A**).
- Sampling and chemical analysis of GWTS influent from the combined active collection wells throughout the year (see results summary in **Table A-2 in Appendix A**).
- Site-wide groundwater and surface water sampling (wells onsite and offsite and Codorus Creek) was conducted during the third and fourth quarters of 2019 following the program detailed in the Site-Wide Cleanup Plan (GSC, 2019a). The data will be provided in separate report.

4.0 GROUNDWATER TREATMENT SYSTEM

During 2019, the GWTS treated groundwater containing dissolved VOCs recovered from two areas of the site (the WPL and SPBA). This groundwater extraction portion of the system consists of eight (8) active wells (CW-9, CW-13, CW-15A, CW-17, CW-20, CW-21, CW-22, and CW-23).

4.1 System Description

Collection wells within the WPL groundwater extraction area and the SPBA remove groundwater by means of electric submersible pumps. The pumping water level within each collection well in the WPL is maintained by liquid level probes and control circuitry between the "on" and "off" probes. The pumping water level is controlled by a transducer in the SPBA wells. The extracted groundwater is conveyed via underground piping to the treatment system where the dissolved VOCs are removed from the groundwater.

The GWTS is housed in Building 41A. The process flow diagram for the system is presented on **Figure 1-3**. The treatment system consists of a 2,600-gallon equalization tank; a PTA capable of treating up to 400 gallons per minute (gpm) of groundwater; and a 10,000-pound vapor-phase GAC unit for PTA off-gas treatment.

Extracted groundwater is pumped from the equalization tank to the PTA. Redux 525 sequestering agent is injected into this flow at a maximum rate of 20 parts per million (ppm) to prevent calcium scale deposits on the packing material and effluent pump system. Simultaneous with the downward flow of contaminated water, a 4,000-cubic-foot-per-minute (cfm) centrifugal blower directs fresh air into the lower section of the tower, and up through the packing material. VOCs present in the influent groundwater are "stripped" from the water, transferred into the air, and then adsorbed to the GAC in the air-phase. The treated groundwater flows by gravity to a wet well (effluent pump station) on the north side of Building 41A. It is then pumped approximately 1,600 feet via an 8-inch underground force main to Outfall No. 003 and discharged to Codorus Creek (see **Figure 1-2**).

Automated monitoring and control of the GWTS are facilitated through a series of control panels, Allen-Bradley programmable logic controllers (PLCs) and patented operator software package called Factory View Talk®. Remote computer terminals monitor collection well pumping rates and treatment processes, and the collection wells may be remotely adjusted. System operational data, recorded in an Excel® data base during 2019, are provided in **Appendix B**.

4.2 System Maintenance and Modifications

In early 2019, fYNOP transitioned from the previous Harley-Davidson-owned hardware, software and licensing for the operations, and established a new cellular communications system, to separate from Harley-Davidson's GIS network. New, updated computer and operating software were purchased/installed, and the operating system licenses were transferred to fYNOP. Additionally, the Building 41A on-site weather station was reconnected to the Harley-Davidson GIS network for weather monitoring.

Twice a month, preventive maintenance inspections are performed when the GWTS is operating. These inspections ensure effective operation of the system. A summary of O&M data recorded during these visits is included in **Appendix C**. Inspections include the following:

- Check for system alarms and address as required.
- Inspect control panels for proper conditions and settings.
- Check water conveyance line pressures.
- Check pressure differential across the stripping tower.
- Check piping and pumps for leaks.
- Clean Y-strainers of buildup, etc., as necessary.
- Check and record amperage draw on all motors (quarterly).
- Record flow rates on recovery wells and transfer pump.

The GWTS operated under normal conditions in 2019, except for the following interruptions:

- A brief shut down occurred on April 2 and October 29 to remove an effluent pump for annual maintenance.
- A brief shut down occurred on May 15 to complete annual maintenance checks on the GWTS.
- A brief shut down occurred on June 2 due to mineral fouling on both effluent pumps. The pumps were cleaned, and the system was restarted.
- A shut down occurred on June 28 for a planned site wide power outage.
- A brief shut down occurred on December 14 due to an influent pump VFD fault caused by two site wide power glitches.
- The GWTS was shut down during scheduled granular activated carbon (GAC) change-outs on March 14, July 30, and October 22.

Several noteworthy treatment system maintenance, repairs, or modifications were identified and addressed during 2019. A brief summary is presented below:

- Two GWTS effluent discharge pumps were removed for annual inspection, cleaning and repair (as needed). Major pump rebuilds were required for both effluent pumps.
- Annual pH meter calibration was completed.

- A new cellular carrier (Verizon) antenna was installed. The groundwater treatment system operating software was upgraded from RSView® to Factory View Talk®.
- The gravel access road to the groundwater treatment system was repaired.
- The chemical pump flow sensor was cleaned numerous times throughout the year.
- A GAC loading evaluation was completed due to the addition of the SPBA system, increased flow from collection well CW-20, and abandonment of the NPBA system, CW-8 (former TCA Area), and the Lift Station
- Annual maintenance was completed to clean the PTA tower windows, remove debris from the PTA sump pit, calibrate the influent pH meter, check PTA tower plumbness, and exercise effluent pump valves.
- A safety observation tour on the groundwater treatment plant noted several items for correction and were addressed.

4.3 Groundwater Withdrawal and VOC Removal

Table 4-1 presents recorded groundwater withdrawal and total VOC mass removal by the GWTS. A system-wide total of approximately 48,018 pounds of VOCs were removed since the GWTS began operation in November 1990.

The total amount of groundwater extracted during 2019 was approximately 127 million gallons (or 349,455 gallons per day [gpd] or 243 gpm average) using the PTA totalizer. The 2019 extraction volumes are higher than the previous year (2018) when the flows were approximately 333,845 gpd (or 232 gpm). A graphical volumes comparison of groundwater treated from the various site extraction systems is presented on **Figure 4-1**. The vast majority of the treated groundwater was from the WPL system during 2019.

Quarterly PTA influent analyses (shown in **Table A-2, Appendix A**), along with the measured extraction volumes, are used to calculate the mass of VOCs removed from site groundwater during the reporting period. The quarterly influent samples collected in January, April, July, and October 2019, represent combined flow-weighted sampling of the five active collection wells in the WPL and three active collection wells in the SPBA (CW-9, CW-13, CW-15A, CW-17, CW-20, CW-21, CW-22, and CW-23). The untreated influent samples contained VOCs ranging in concentrations from 713 micrograms per liter (µg/L) to 905 µg/L during 2019. Using these data, the total estimated mass of VOCs removed from January through December 2019 was 821 pounds. The calculated VOC mass removal rates (pounds per day [lbs/day]) extracted by the GWTS for the last four calendar years are shown below:

- 2019 – 2.3 lbs/day
- 2018 – 2.3 lbs/day
- 2017 – 2.9 lbs/day
- 2016 – 4.0 lbs/day
- 2015 – 5.7 lbs/day

The predominant VOCs in the PTA influent historically were TCE, TCA, and PCE (see **Figure 4-2)**. Levels of influent total VOCs were somewhat stable over the last few years but have decreased during this reporting period. The predominant influent VOC changed from TCE to PCE during the spring of 2013, and the concentration of PCE further increased upon startup of CW-20 during 2014. Concurrent with the GWTS shutdown and restart, a spike in the influent concentration of cis-1,2-DCE was noted during 2015 and early 2016. The predominant GWTS influent VOCs during 2019 were PCE, TCE/cis-1,2-DCE, and TCA (see **Figure 4-2**).

4.4 Groundwater System Inspection and Reporting

Groundwater system compliance reporting includes routine monthly and quarterly NPDES permit. Discharge Monitoring Reports, quarterly Susquehanna River Basin Commission (SRBC) reports, and an annual operations report for the GWTS. PADEP Chapter 110 (formerly Act 220) also requires an annual groundwater withdrawal report from this facility.

The PTA effluent was sampled and reported six times during 2019. Analytical testing results for the 2019 PTA effluent and influent sampling is presented in **Table A-2 (Appendix A)**. The treatment system effluent has maintained non-detectable concentrations of target VOCs during this reporting period, except for cis-1,2-DCE (PADEP requested testing, with estimated detections < 0.3 µg/l).

On a quarterly basis, groundwater withdrawal data are submitted to the SRBC regarding non-consumptive groundwater withdrawal associated with the GWTS in accordance with docket Nos. 19900715-1 and 19980901-1. Information provided to the SRBC includes daily groundwater withdrawal totals (i.e., groundwater volumes extracted) from all collection wells.

5.0 WEST PARKING LOT GROUNDWATER EXTRACTION SYSTEM

Four (4) groundwater collection wells (CW-9, CW-13, CW-17, and CW-20) are in the WPL Area of the West Campus. One additional collection well (CW-15A) is now located in a trailer parking area of the West Campus.

Groundwater extraction from the WPL wells is conducted via underground piping to the GWTS in Building 41A. The wells are individually piped to the GWTS so that flow control, flow measurements, and water samples may be obtained for each well at this central location. Water is piped the following distances from the wells to the treatment plant: CW-20 (1,600 feet), CW-9 (1,400 feet), CW-13 (890 feet), CW-15A (310 feet), and CW-17 (590 feet). Approximately 137 million gallons of groundwater were extracted from the WPL Area during 2019 (see **Table 5-1**).

5.1 Maintenance

A brief summary of maintenance actions for the WPL Area in 2019 is presented below:

- Collection well CW-15A overload faults occurred in February, August, and November 2019. The pump assembly was pulled and cleaned, and the piping manifold was flushed on February 4, August 27 and 28, and November 26.
- Excessive cycling was noted in collection well CW-17 due to the Warrick controls chattering. The probe wiring was replaced and the wiring connections in the well head were heat spliced.

5.2 Groundwater Chemistry

The groundwater quality analysis data from the 2019 collection well sampling is presented in **Table A-1 (Appendix A)**. The historical concentrations and trends of the dominant VOCs (TCE, PCE, TCA, and cis-1,2-DCE) are illustrated in **Figures 5-1 through 5-5** for CW-9, CW-13, CW-15A, CW-17, and CW-20, respectively. With exception of CW-20, decreasing or nearly stable VOC trends were observed in all the active WPL collection wells during 2019. The highest concentration of VOCs continues to be found at CW-15A, with the level of 1,1,1-TCA (up to 5,900 µg/L) being the highest VOC detected, followed closely by cis-1,2-DCE with levels around 5,600 µg/L. TCA is not significant in any of the other WPL extraction wells. Extraction well CW-20 had the second highest levels of VOCs, dominated by PCE at concentrations of approximately 1100 µg/L, and TCE with a concentration around 370 µg/L. Extraction well CW-9 is also dominated by PCE. Extraction well CW-13 had concentrations of cis-1,2-DCE of 380 µg/L and PCE around 120 µg/L. The concentration of VOCs detected in extraction well CW-17 was the lowest of the WPL extraction wells.

5.3 Collection Well CW-20 Rehabilitation Monitoring

Four well rehabilitation events occurred at the southwest West Parking Lot (SW-WPL) collection well CW-20, in response to significantly decreased pumping rates below 50 gpm (normally 60-90 gpm) following startup in April 2014. The well rehabilitation events included: April 2016 (Event 1); May 2017 (Event 2); December 2017 (Event 3); and May 2018 (Event 4). During the first 3 rehabilitation events, the well was redeveloped using brushing, surging and pumping methods. Whereas during Event 4, the well was redeveloped using a back-flushing technique. Significantly improved well efficiency was observed at CW-20 following Event 4, with maximum CW-20 drawdown of approximately 1 to 2 feet. After the Event 4 rehabilitation, CW-20 was set to operate at 60 gpm. Collection well CW-20 was sampled for VOCs while pumping at 60 gpm and one month after increasing the pumping rate. During 2019, the CW-20 pumping rate was incrementally increased ten (10) gpm in April, June, and July and an additional five (5) gpm in October (see **Figure 5-6**). PCE and TCE concentrations increased as the pumping rates increased to 90 gpm. PCE concentrations increased from 400 µg/L in April (60 gpm) to 11,000 µg/L in September (90 gpm). TCE concentrations increased from 150 µg/L in April to 370 µg/L in September. Concentration slightly decreased when the pumping rate was increased to 95 gpm in October 2019. Collection well CW-20 continued to operate at its pumping capacity (95 gpm) from October through the end of 2019.

Groundwater level monitoring transducers were installed in CW-20 and several surrounding wells to monitor changes to groundwater elevations as the pumping rate was increased in CW-20 (see **Figure 5-7**). The groundwater treatment system was shut down June 28 for a plant-wide maintenance power outage and briefly in July and October for GAC change outs. Collection well CW-20 rebounded during the shutdown periods. There was little to no change in CW-20 drawdown groundwater elevations when the pumping rate was increased to 70 and 80 gpm. A slight decline in groundwater elevation occurred when the rate was increased to 90 gpm and relatively no change when the rate was increased to 95 gpm.

6.0 SPBA GROUNDWATER EXTRACTION SYSTEM

The SPBA groundwater extraction system captures shallow groundwater containing PCE and TCE from the fine-grained residual soil and bedrock along the eastern-most portion of the south fYNOP property boundary. Three SPBA collection wells (CW-21, CW-22, CW-23) were installed, and the SPBA collection wells pumping started on October 31, 2018. Following startup, an effectiveness report concluded "the SPBA groundwater extraction system is currently operating as designed and meets the objective of pumping to establish a groundwater gradient that slopes from off-Site wells located along Canterbury Lane toward on-Site wells located in the SPBA" (GSC, 2019b).

Each SPBA collection well is fitted with electric submersible pumps controlled by VFDs and a submersible level transducer to maintain design drawdown conditions. Groundwater extracted from the SPBA wells is conducted via underground piping from the well heads to the SPBA control building (located in the SPBA) and the combined effluent is transferred to the GWTS in Building 41A. The SPBA control building houses the PLC, control panel, and separate pressure and flow transmitters, piping and valves for each of the extraction wells. The wells are individually piped to the SPBA control building so that flow control, flow measurements, and water samples may be obtained for each well at this central location. Water is piped the following approximate distances from the wells to the SPBA transfer building: CW-21 (550 feet), CW-22 (400 feet), and CW-23 (300 feet). The SPBA control building is approximately 2,500 feet from the GWTS Building 41A. Approximately 3,551,000 gallons of groundwater were extracted from the SPBA Area during 2019 (see **Table 5-1**).

6.1 System Installation and Operational Controls

A controls building was installed in the SPBA area for the addition of the SPBA collection well network. Each well is piped to the SPBA controls building via 2-inch high density polyethylene (HDPE) underground conveyance piping. Two (2) 3-inch diameter HPDE conveyance pipes (active and spare) were installed from the building and tied into the existing GWTS conveyance piping near Gate 5 in February 2018. Each well has a level transducer to control the pumping rate. The SPBA collection well pumping rates range from 0.5 to 6 gpm.

6.2 Maintenance

A brief summary of maintenance actions for the SPBA Area in 2019 is presented below:

- The SPBA system temporarily lost power in January, April, October, and November due to storms in the area.
- Extraction well CW-21 transducer faults occurred in June, July, and August. The transducer was sent back to the manufacture in August. A new transducer was installed in November.
- The SPBA collection well control panels were grounded to the well heads, and grounding was installed from the antenna surge protector the SPBA building

grounding in August.

6.3 Groundwater Chemistry

The groundwater quality analysis data from the 2019 collection well sampling is presented in **Table A-1 (Appendix A)**. The concentrations and trends of the dominant VOCs (TCE, PCE, TCA, and cis-1,2-DCE) are illustrated in **Figures 6-1 through 6-3** for CW-21, CW-22, and CW-23, respectively. The highest concentration of VOCs in the SPBA area are at CW-21 with a concentration of PCE (260 µg/L) being the highest VOC detected. Extraction well CW-22 had the second highest levels of VOCs, dominated by PCE at a concentration 110 µg/L. The concentration of VOCs detected in extraction well CW-23 was the lowest of the SPBA extraction wells with a PCE concentration of 42 µg/L.

7.0 REFERENCES

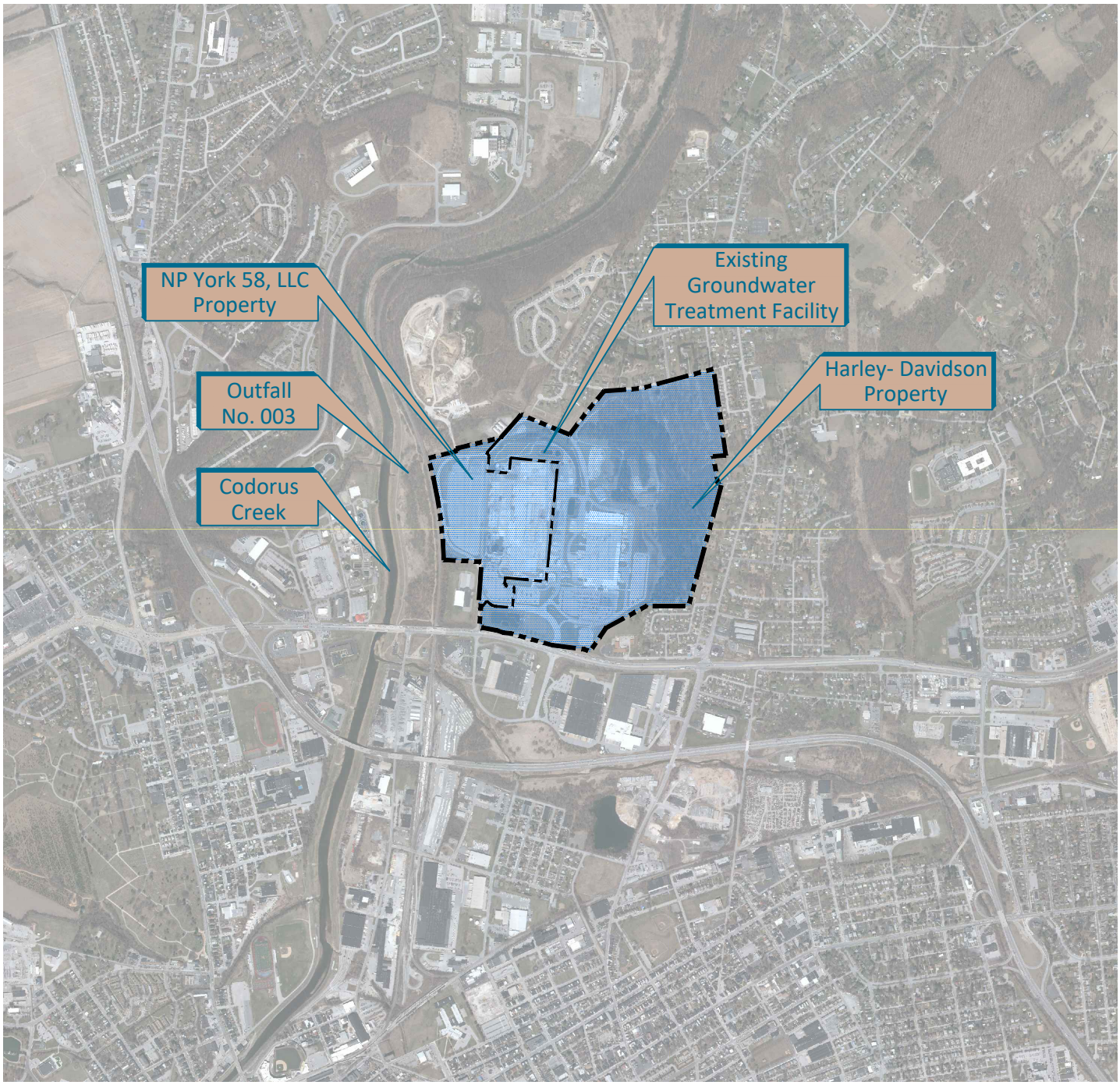
Groundwater Sciences Corporation (GSC), 2018a. 2018 Annual Monitoring Progress Report for the NPBA Extraction System Shutdown, Former York Naval Ordnance Plant, 1425 Eden Road, Springettsbury Township, York Pennsylvania, April 9.

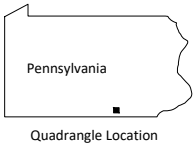
GSC, 2018b. Supplemental Remedial Investigation Groundwater Report (Part 2), Former York Naval Ordnance Plant, March (Revised).

GSC, 2019a. Site-Wide Cleanup Plan, Former York Naval Ordnance Plant, 1425 Eden Road, Springettsbury Township, York Pennsylvania, November 25.

GSC, 2019b. Southern Property Boundary Area Groundwater Extraction System Operation Effectiveness Report, Former York Naval Ordnance Plant. October 28.

FIGURES





Quadrangle Location

N

2000' 0 2000'

SCALE IN FEET

LEGEND

Property Boundary
(Former York Naval Ordnance Plant;
Approximately 229 Acres)

NOTE:

Aerial Imagery is from the York County Planning Commission Aerial mapping project, dated 2015, obtained from the Pennsylvania Spatial Data Access website (www.pasda.psu.edu)

client: FORMER YORK NAVAL ORDNANCE PLANT

project location: 1425 Eden Road
York, Pennsylvania

Hydro-Terra GROUP
www.hydro-terra.com

project: Operations & Maintenance Manual

Site Location Map

file no.	SLM.dwg	
drawn M. Swam	date 01/23/18	figure: 1
checked E. Wade	date 01/23/18	
approved R. Myers	date 01/23/18	

Plotted on: January 4, 2019

H:\Projects\Harley-Davidson_CADD\SLM.dwg

NPBA Control Bldg

NPBA Groundwater Conveyance Pipe to Treatment Plant

Treatment System Discharge Line

Groundwater Treatment Plant (Bldg 41A)

NPBA Groundwater Collection Pipe to Control Building

Outfall No. 003

WPL Collection Pipes to Treatment Plant

SPBA Conveyance Pipe

Former Lift Station

SPBA Control Building

Codorus Creek

30

N

Legend

- Monitoring Well & Designation
- Extraction Well & Designation
- Treatment System Features
- Streams, Creeks, and Ponds
- Roads, Curbs, & Boundaries
- Railroad Tracks
- West Campus Boundary
- Property Boundary
- Existing Buildings
- Northeast Property Boundary Area
- Southern Property Boundary Area
- West Parking Lot (WPL) Area
- Stormwater Basin

0 250 500 1,000

Feet

Former York Navel Ordnance Plant

1425 Eden Road
York, Pennsylvania 17402

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Groundwater System Operations

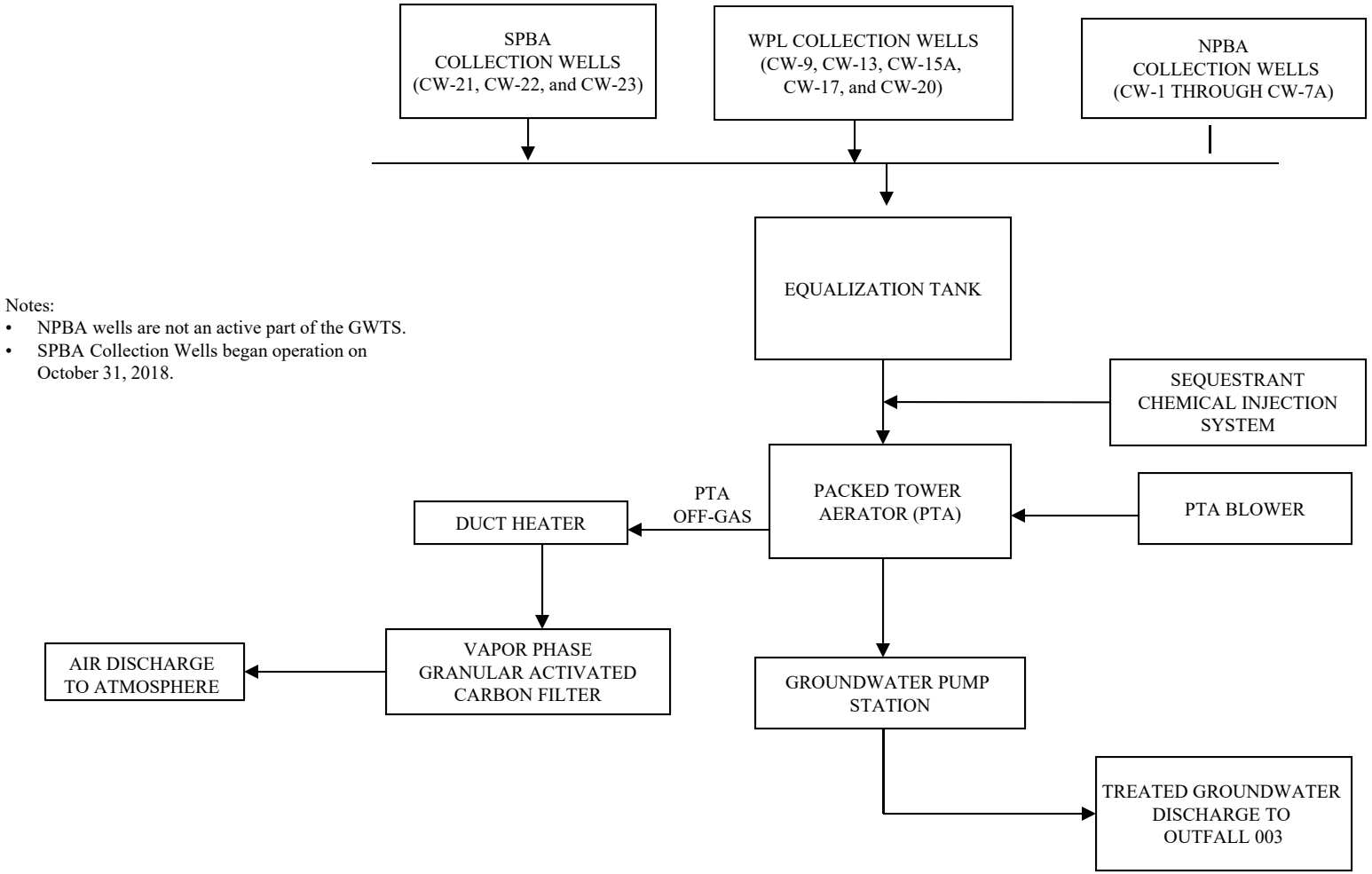
Groundwater Treatment System Location

drawn:	LPD	3/12/20	figure: 1-2
checked:	EMW	xx/xx/xx	
approved:	RGM	xx/xx/xx	

Document Path: J:\Harley-Davidson\Maps\2020-03-09 Groundwater System Operations.mxd

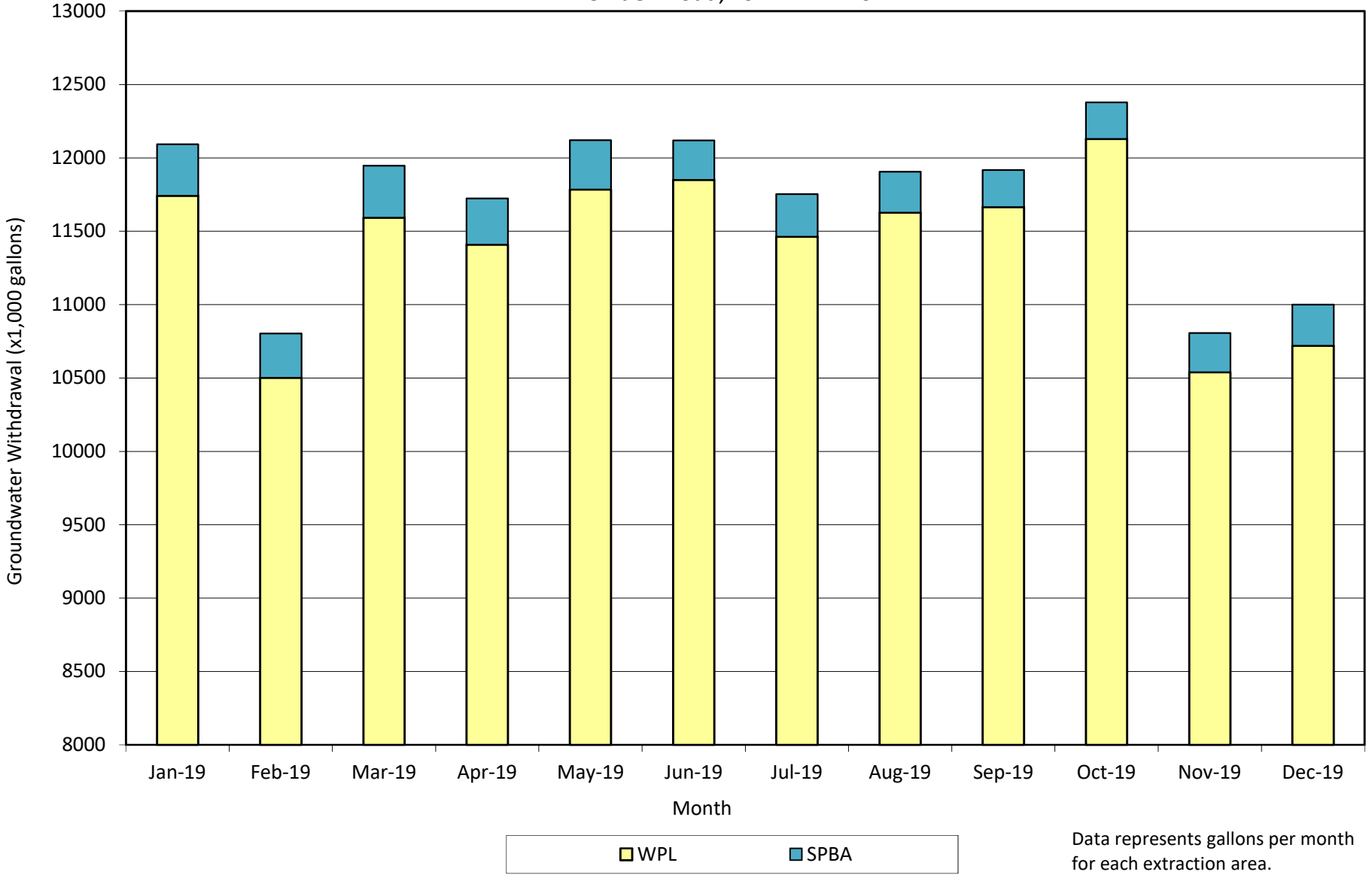
Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet

FIGURE 1-3
GROUNDWATER TREATMENT SYSTEM FLOW DIAGRAM
former York Naval Ordnance Plant



Notes:
- NPBA wells are not an active part of the GWTS.
- SPBA Collection Wells began operation on October 31, 2018.

Figure 4-1
2019 Groundwater Withdrawals
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402



Data represents gallons per month for each extraction area.

Figure 4-2
Packed Tower Aerator Influent Chemistry
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

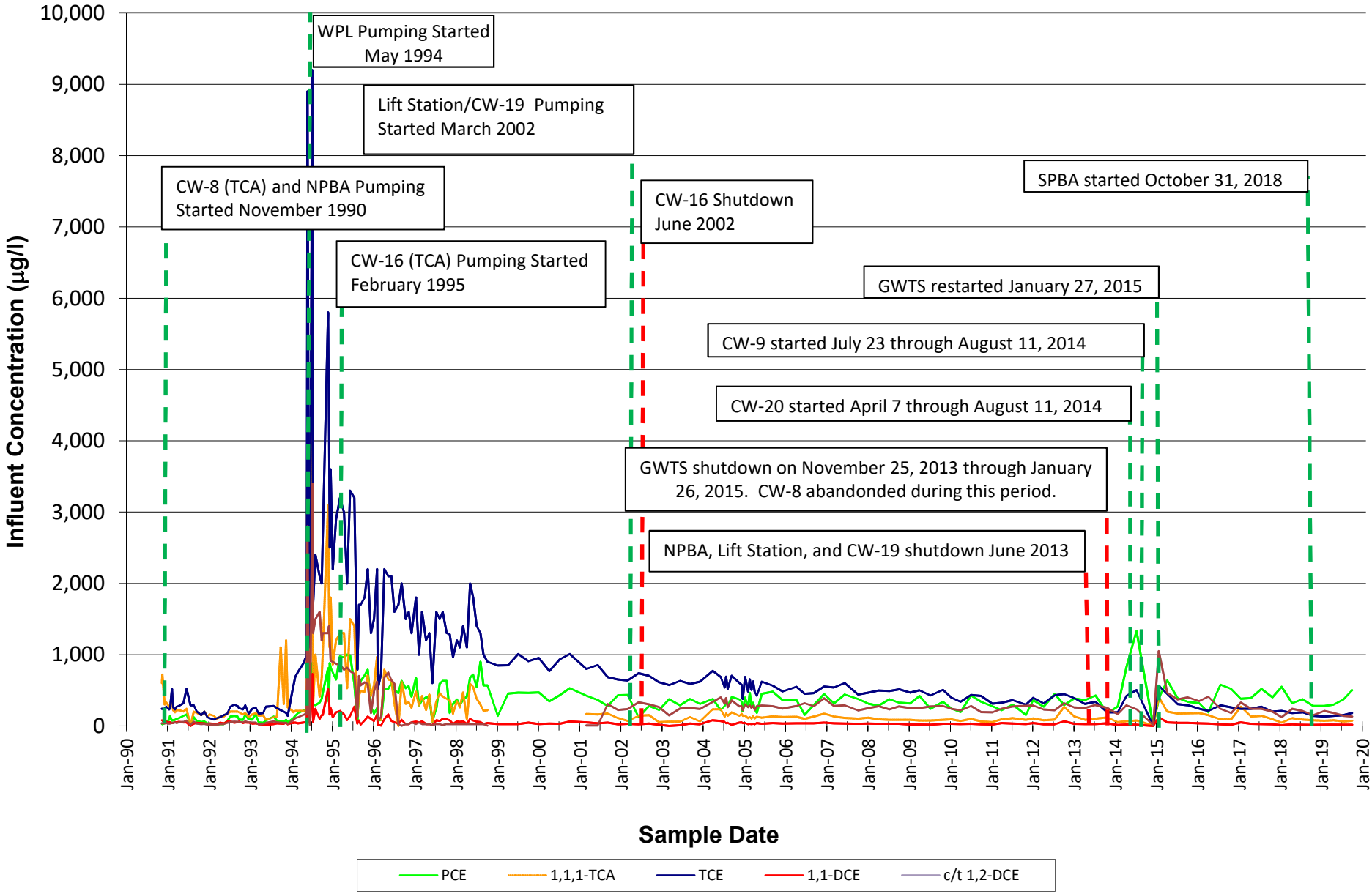


Figure 5-1
Predominant VOC Concentrations - Collection Well CW-9
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

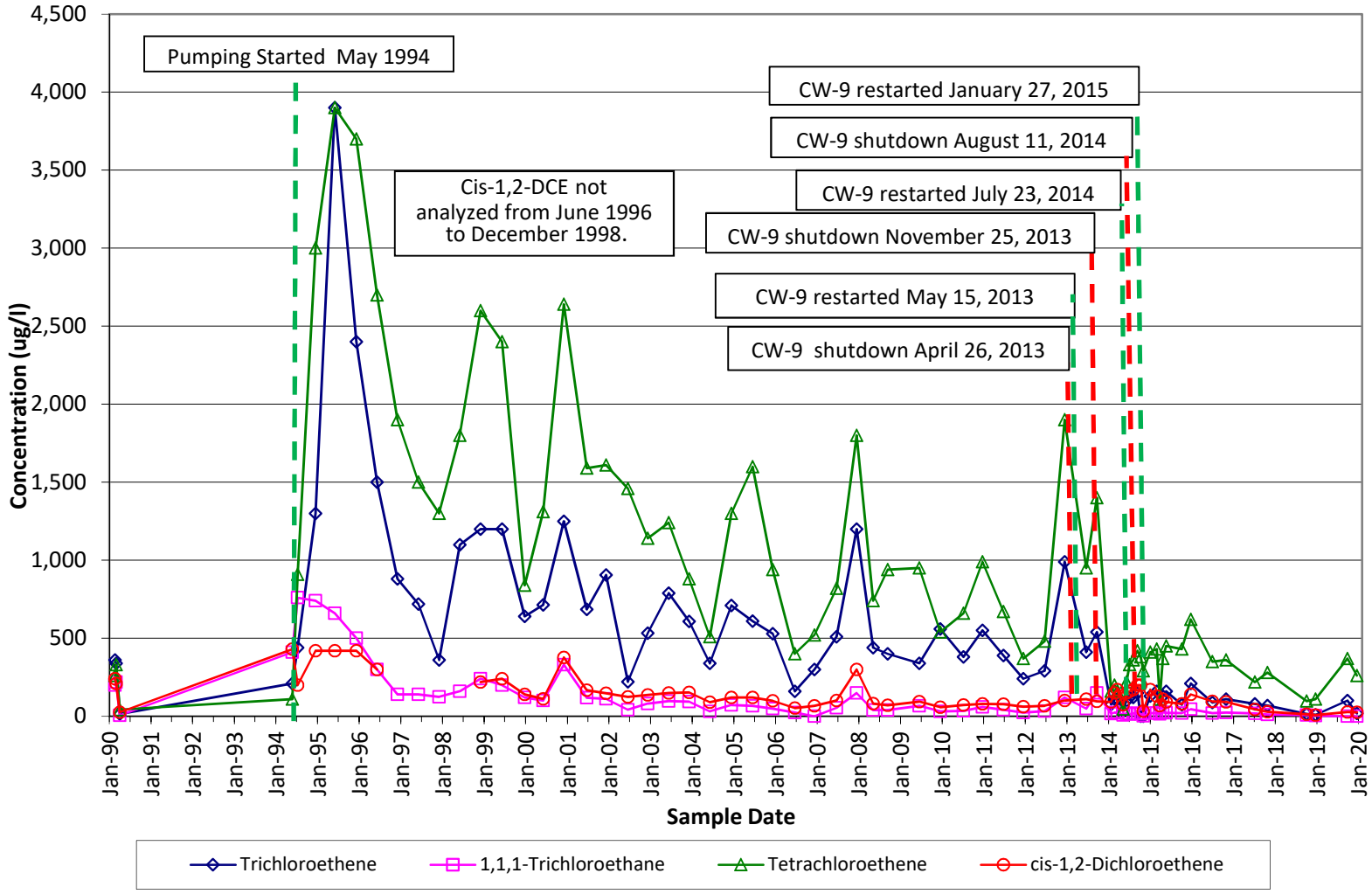


Figure 5-2
Predominant VOC Concentrations - Collection Well CW-13
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

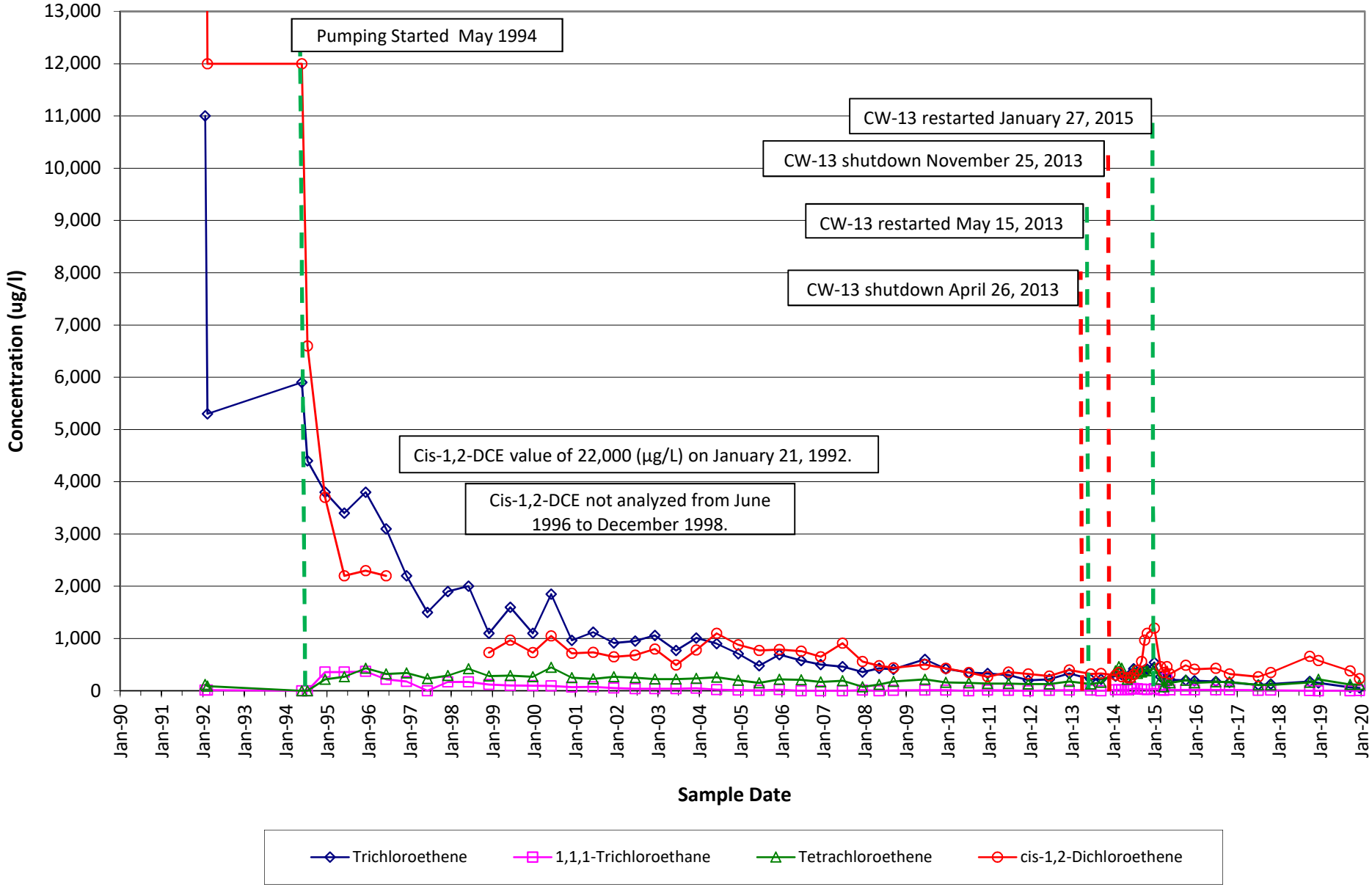


Figure 5-3
Predominant VOC Concentrations - Collection Well CW-15A
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

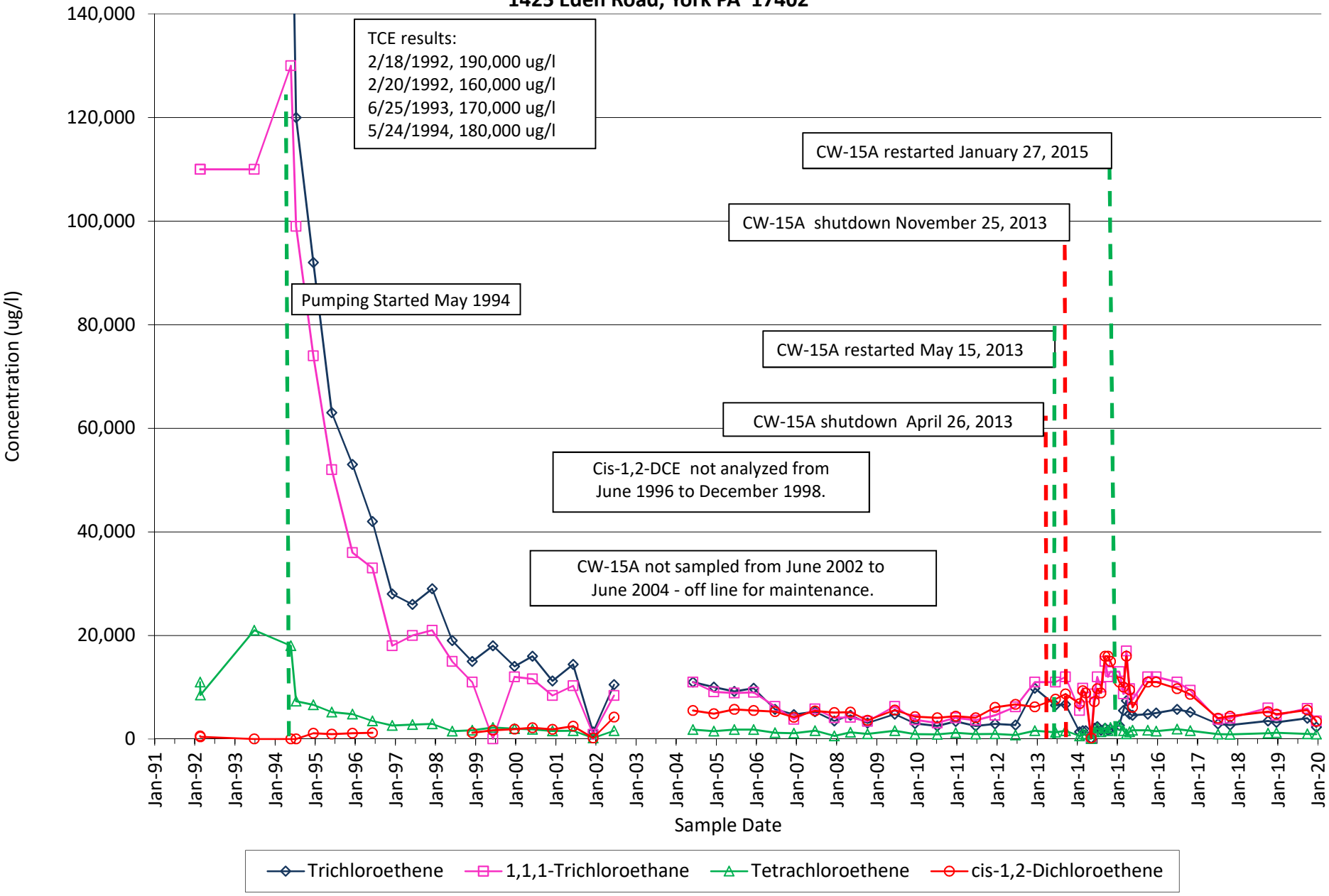


Figure 5-4
Predominant VOC Concentrations - Collection Well CW-17
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

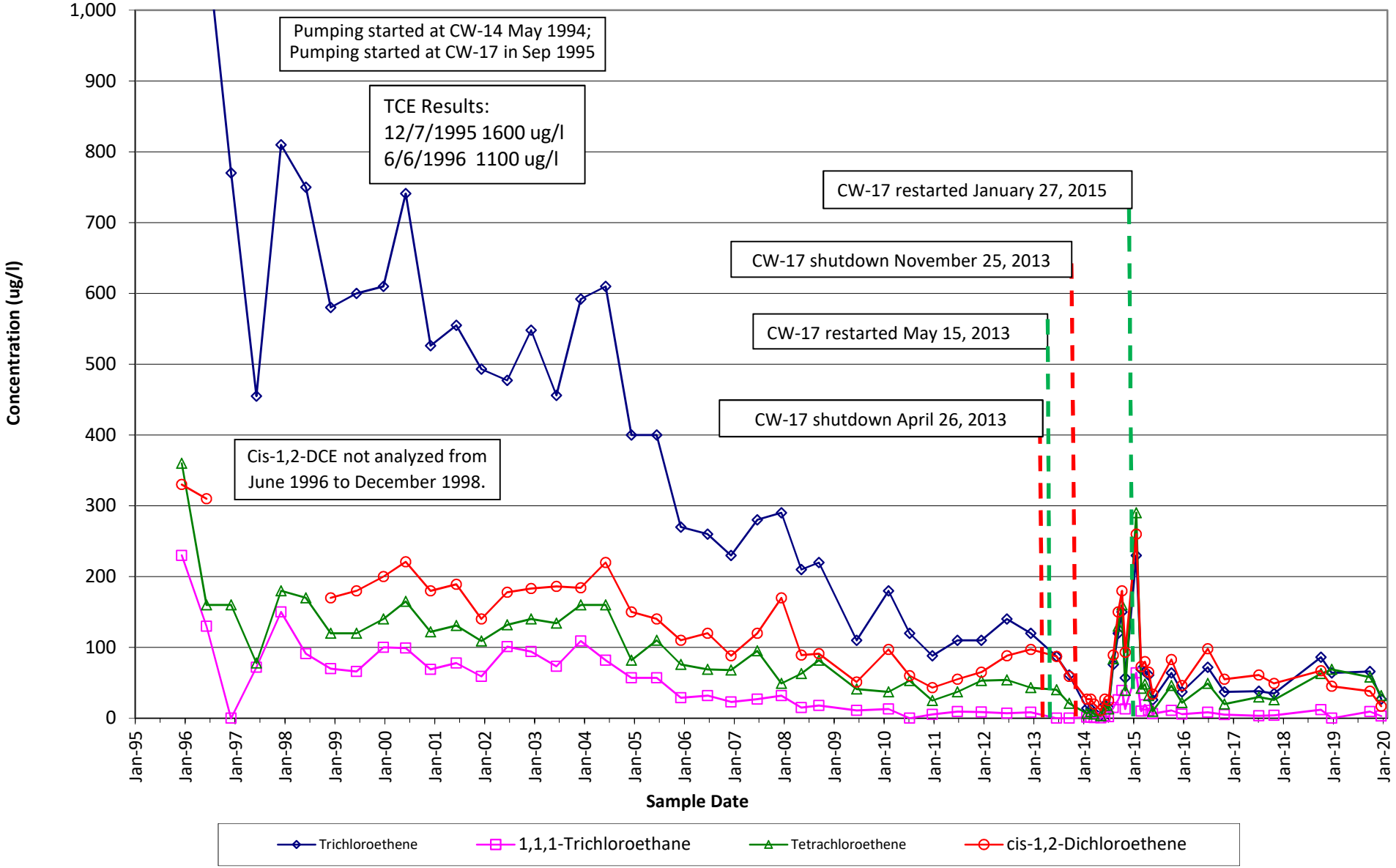


Figure 5-5
Predominate VOC Concentrations - Collection Well CW-20
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

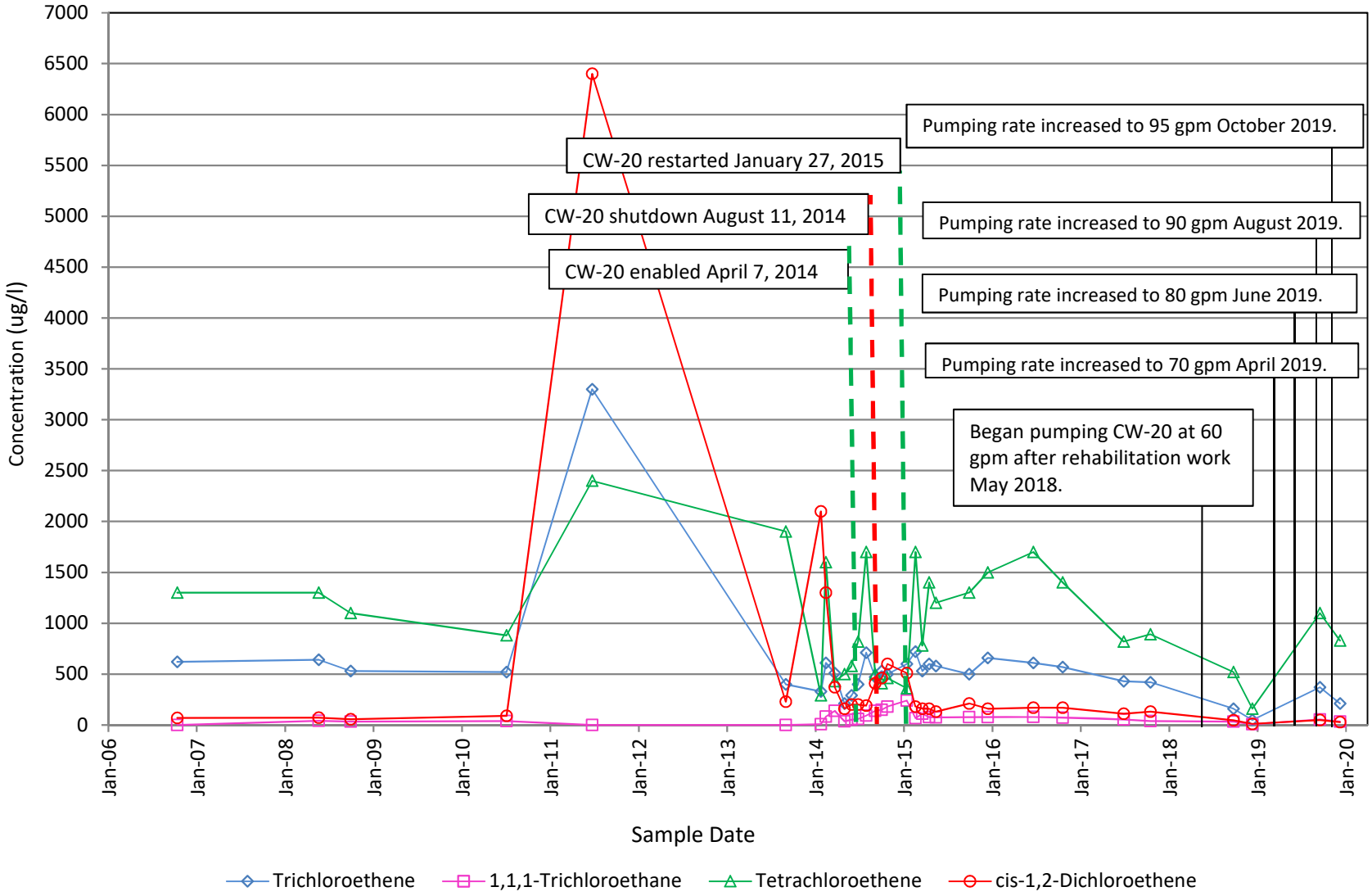
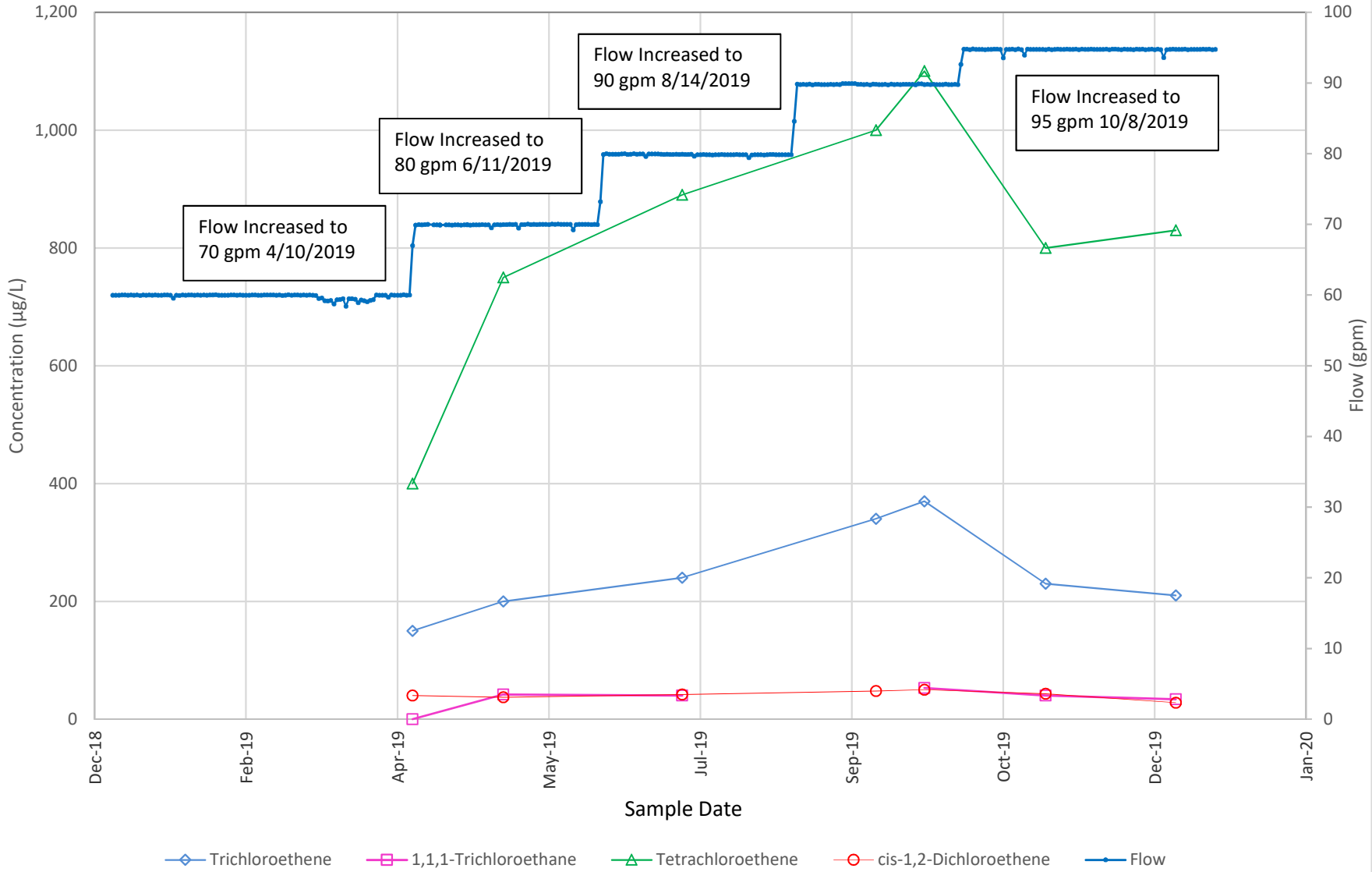
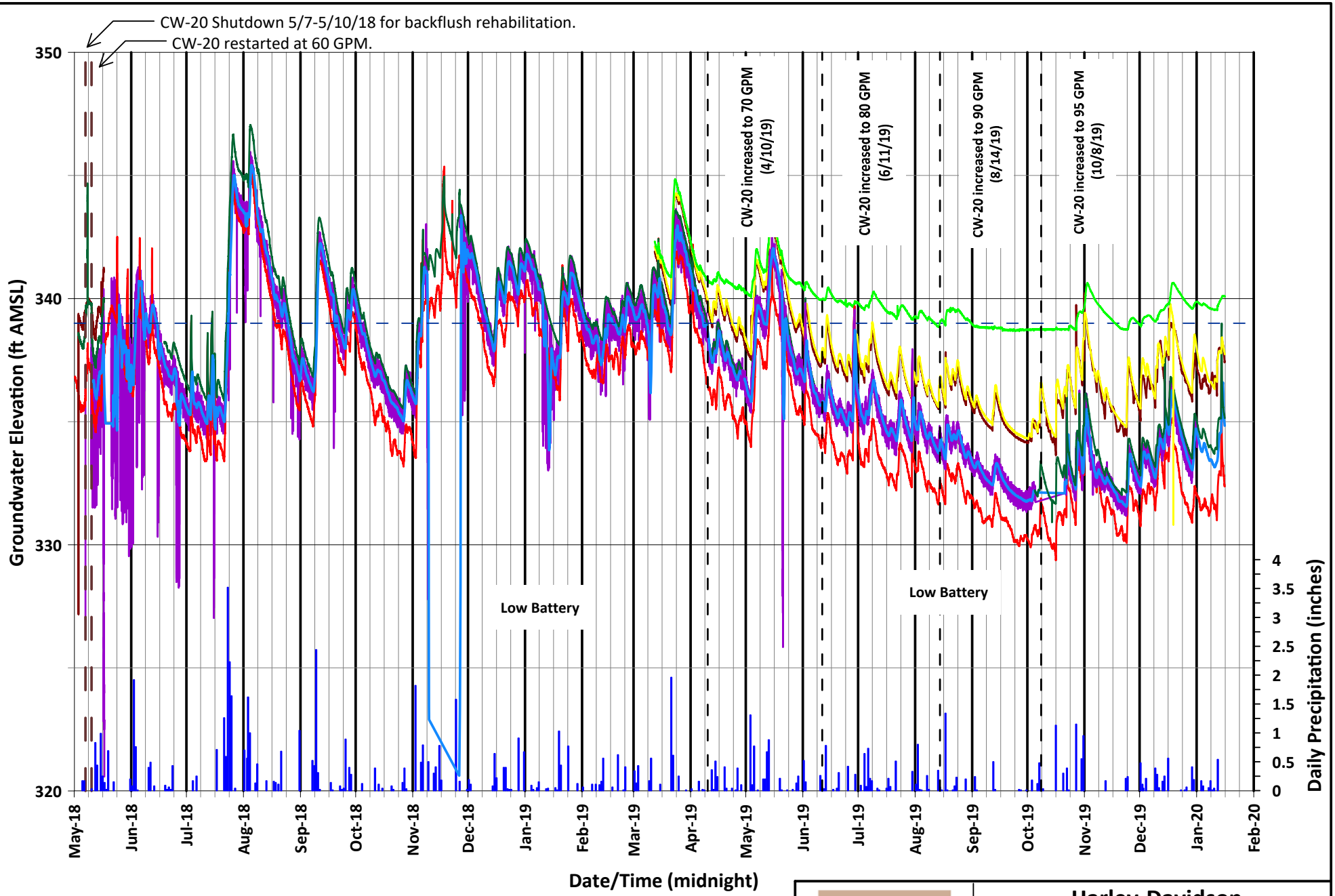


Figure 5-6
VOC Trend and Pumping Rates - Collection Well CW-20
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402





CW-9
MW-75D
CW-20, 24-hr moving average
CW-20
Approx. Elevation of Codorus Creek @ 339'
MW-93S
MW-107
MW-37S

*CW-20 had low battery. Data between 10/5-21/19 is not good. Batteries replaced on 10/21/19.
Daily precipitation recorded from on site.
No transducer data in MW-75D from 5/17-6/19/2018.

Hydro-Terra Group
www.hydro-terra.com

Harley-Davidson
York, Pennsylvania
CW-20 Rehabilitation
Groundwater Elevation Monitoring Record

drawn	RWL	checked	MDH	approved	RJM
date	1/31/2020	date	10/25/19	date	10/25/19
project no.				file	

Graph 5-7

Figure 6-1
Predominate VOC Concentrations - Collection Well CW-21
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

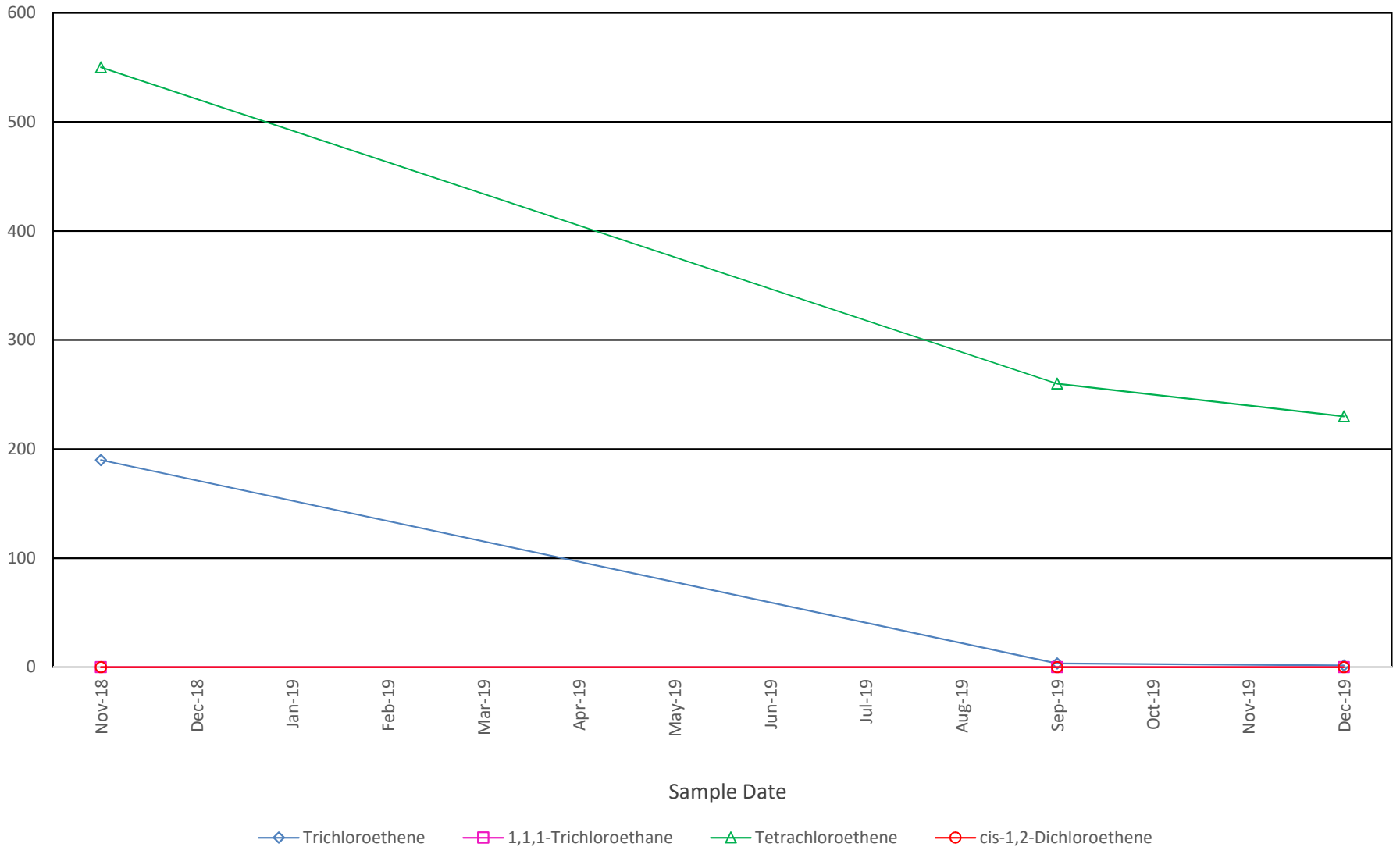


Figure 6-2
Predominate VOC Concentrations - Collection Well CW-22
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

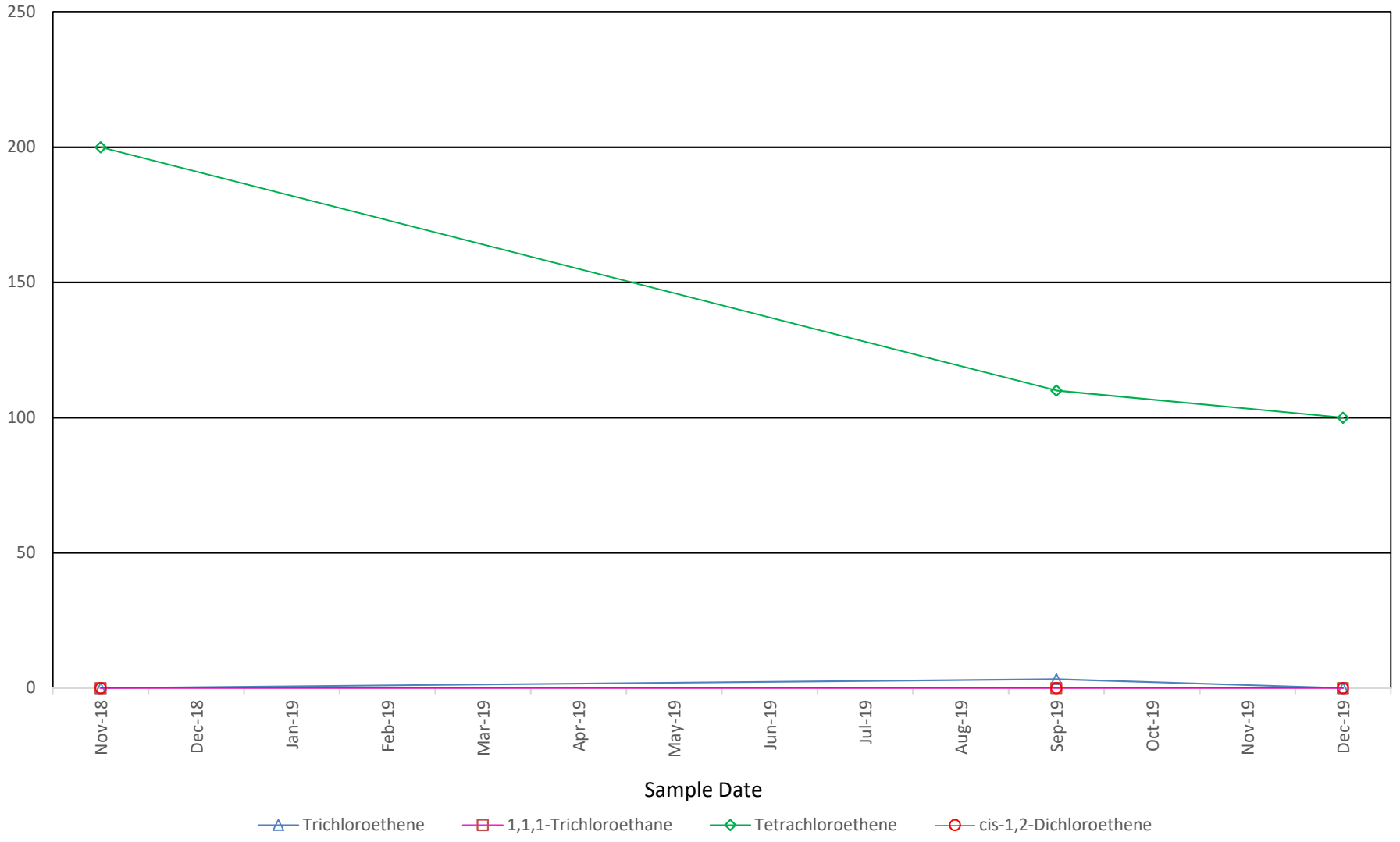
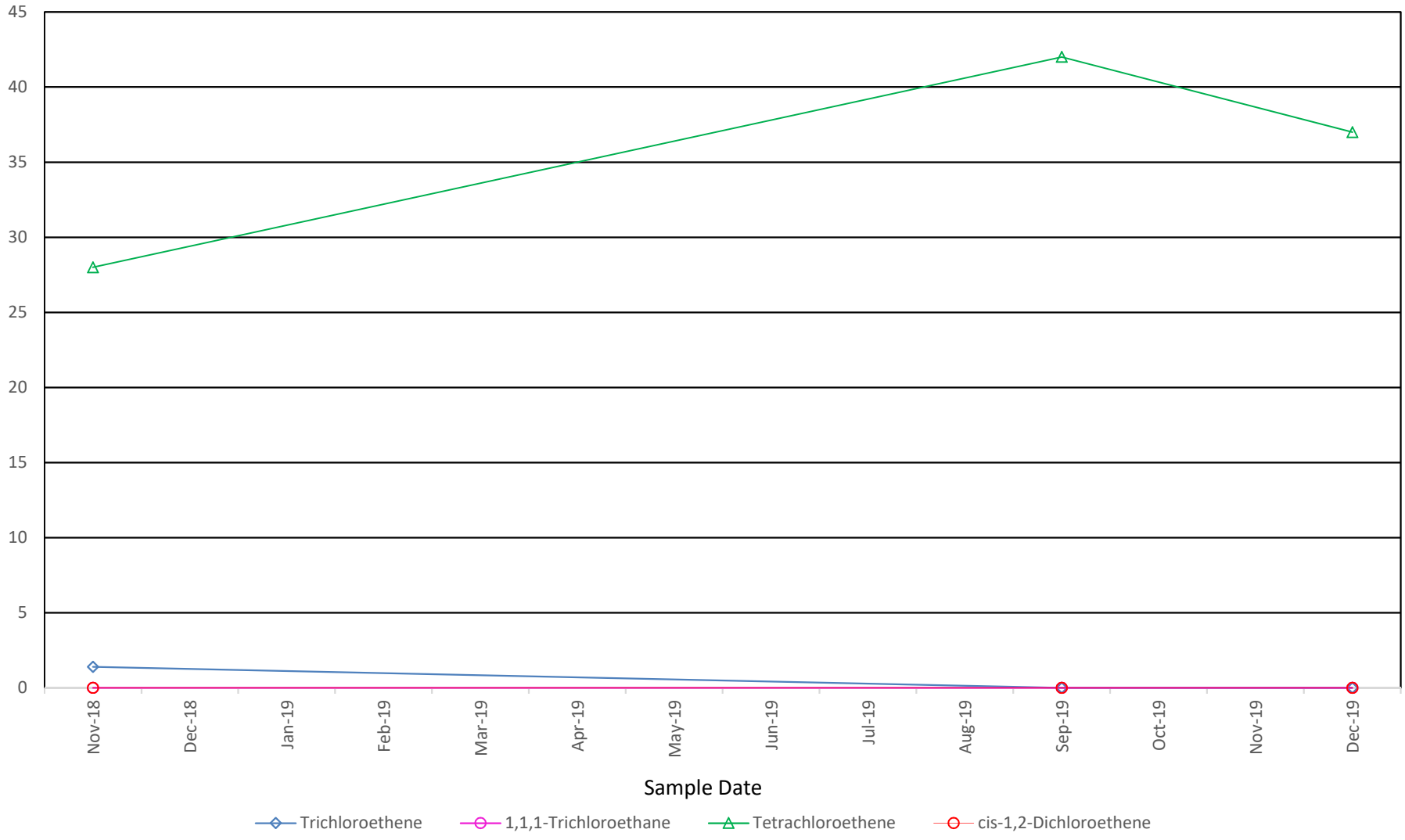


Figure 6-3
Predominate VOC Concentrations - Collection Well CW-23
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402



TABLES

TABLE 4-1
VOCs REMOVED FROM COLLECTED GROUNDWATER
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

JANUARY 1, 2019 - DECEMBER 31, 2019			
DATE	MONTHLY GROUNDWATER WITHDRAWAL (AST Totalizer, gallons)	AVERAGE MONTHLY TOTAL VOCs (ppb)	ESTIMATED MONTHLY VOC REMOVAL (pounds)
Jan-19	10,949,529	713	65
Feb-19	9,793,800	713 *	58
Mar-19	10,826,171	713 *	64
Apr-19	10,622,922	721	64
May-19	11,067,761	721 *	67
Jun-19	10,263,261	721 *	62
Jul-19	10,858,516	745	68
Aug-19	11,088,001	745 *	69
Sep-19	10,685,530	745 *	66
Oct-19	11,090,061	905	84
Nov-19	9,972,136	905 *	75
Dec-19	10,333,429	905 *	78
TOTAL	**127,551,117**	**NA**	**821**

NOTES:

1. * - No sample collected this month; concentration is the most recent
2. NA - Not Applicable

ANNUAL TOTALS		
YEAR	GROUNDWATER WITHDRAWAL (gallons)	ESTIMATED VOC REMOVAL (pounds)
1990 (NOV & DEC)	12,954,886	92
1991	62,458,393	357
1992	66,081,120	322
1993	72,198,940	421
1994	88,387,251	3,905
1995	141,357,856	5,572
1996	152,168,899	3,631
1997	150,246,400	2,675
1998	157,461,800	2,795
1999	133,687,100	1,464
2000	152,839,477	1,785
2001	134,557,249	1,659
2002	121,290,897	1269
2003	153,097,508	1,599
2004	140,725,167	1,786
2005	134,503,508	1,550
2006	125,192,364	1,295
2007	149,331,940	1,734
2008	155,341,655	1,560
2009	161,171,721	1,584
2010	159,042,802	1,388
2011	154,368,351	1,196
2012	153,624,656	1,519
2013	145,516,783	1,321
2014	17,300,548	262
2015	105,746,121	1,501
2016	113,974,022	1,058
2017	112,873,883	1,041
2018	121,853,402	856
2019	127,551,117	821
Total	**3,676,905,816**	**48,018**

TABLE 5-1
2019 RECORD OF GROUNDWATER WITHDRAWALS
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

MONTH	WPL WELLS (gallons)						SPBA WELLS (gallons)[2]				Monthly [1] TOTAL (gallons)
	CW-9	CW-13	CW-15A	CW-17	CW-20	SUBTOTAL	CW-21	CW-22	CW-23	SUBTOTAL	
Jan-19	2,548,446	2,257,918	98,891	4,169,426	2,666,349	11,741,030	211,010	75,568	64,590	351,168	12,092,198
Feb-19	2,263,773	1,957,009	104,708	3,767,357	2,409,023	10,501,870	183,550	67,342	50,746	301,638	10,803,508
Mar-19	2,469,005	2,206,638	129,646	4,140,102	2,646,343	11,591,734	209,266	77,598	67,667	354,531	11,946,265
Apr-19	2,373,791	2,045,952	117,954	3,998,467	2,872,462	11,408,626	196,146	73,319	46,000	315,465	11,724,091
May-19	2,469,844	2,017,939	120,856	4,078,134	3,097,012	11,783,785	209,565	75,355	51,749	336,669	12,120,454
Jun-19	2,228,517	1,768,827	99,330	3,746,716	4,006,256	11,849,646	186,627	64,685	18,602	269,914	12,119,560
Jul-19	2,417,636	1,744,467	99,715	3,687,567	3,512,593	11,461,978	181,758	75,724	33,484	290,966	11,752,944
Aug-19	2,274,560	1,729,436	102,950	3,719,736	3,799,403	11,626,085	173,201	80,328	26,658	280,187	11,906,272
Sep-19	2,197,871	1,538,956	200,729	3,863,705	3,863,693	11,664,954	160,306	71,178	20,150	251,634	11,916,588
Oct-19	2,291,150	1,563,469	225,598	3,932,716	4,115,736	12,128,669	156,959	79,953	13,394	250,306	12,378,975
Nov-19	2,234,267	1,528,337	198,041	2,501,753	4,076,543	10,538,941	173,291	75,933	18,664	267,888	10,806,829
Dec-19	2,316,879	1,575,370	216,634	2,408,696	4,201,222	10,718,801	177,092	80,042	24,342	281,476	11,000,277
TOTALS	28,085,739	21,934,318	1,715,052	44,014,375	41,266,635	137,016,119	2,218,771	897,025	436,046	3,551,842	140,567,961

Notes:

[1] Monthly groundwater withdrawal value from Table 4-1 differs slightly from the monthly total. The value in Table 4-1 is taken from the PTA totalizer. The monthly total is the sum of the individual well totalizers.

[2] SPBA collection wells pumping started October 31. 2018.

APPENDIX A

Data Tables

Table A-1.
2019 Groundwater Data Summary - Collection Wells
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

					WPL Collection Wells																			
Location/ID	MSC	MSC	Federal	EPA RSL	CW-9		CW-9		CW-13		CW-13		CW-15A		CW-15A		CW-17		CW-17		CW-20		CW-20	
Sample Date	UA R	UA NR	MCL	Tap Water	9/26/2019		12/18/2019		9/26/2019		12/18/2019		9/26/2019		12/18/2019		9/26/2019		12/18/2019		9/26/2019		12/18/2019	
Parameter	(ug/L)	(ug/L)	(ug/L)	(ug/L)		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual
1,1,1,2-Tetrachloroethane	70	70		0.57	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
1,1,1-Trichloroethane	200	200	200	8000	25	U	25	U ^c	2.5	U	3.7		5900		3500		9.5		3.1		53	J	34	
1,1,2,2-Tetrachloroethane	0.84	4.3		0.076	2.5	U	25	U ^c	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
1,1,2-Trichloroethane	5	5	5	0.28	2.5	U	25	U	2.5	U	1	U	50	U	0.56	J	5	U	1	U	10	U	1	U
1,1-Dichloroethane	31	160		2.8	3.1		25	U	2.5	U	1	U	130		48		5.4		2		12		7	U
1,1-Dichloroethene	7	7	7	280	3.4	J	25	U	2	J	2.6		1100		730		6.8	J	2		10	J	5.3	
1,2-Dibromoethane	0.05	0.05	0.05	0.0075	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
1,2-Dichloroethane	5	5	5	0.17	2.5	U	25	U	2.5	U	1	U	50	U	1.9		5	U	1	U	10	U	1	U
1,2-Dichloropropane	5	5	5	0.44	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
2-Butanone	4000	4000		5600	13	U	130	U ^c	13	U	5	U ^c	250	U	50	U ^c	25	U	5	U ^c	50	U	5	U ^c
2-Hexanone	63	260		38	13	U	130	U ^c	13	U	5	U	250	U	5	U	25	U	5	U ^c	50	U	5	U ^c
4-Methyl-2-Pentanone	3300	9300		6300	13	U	130	U ^c	13	U	5	U	250	U	5	U	25	U	5	U ^c	50	U	5	U ^c
Acetone	38000	110000		14000	13	U	130	U	13	U	5	U ^c	250	U	5	U ^c	25	U	5	U ^c	50	U	5	U ^c
Acrylonitrile	0.72	3.7		0.052	50	U	500	U	50	U	20	U	1000	U	20	U	100	U	20	U	200	U	20	U
Benzene	5	5	5	0.46	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Bromochloromethane	90	90		83	2.5	U	25	U	2.5	U	1	U ^c *	50	U	1	U	5	U	1	U ^c	10	U	1	U
Bromodichloromethane	80	80		0.13	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Bromoform	80	80		3.3	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Bromomethane	10	10		7.5	2.5	U	25	U	2.5	U	1	U ^c	50	U	1	U ^c	5	U	1	U	10	U	1	U
Carbon Disulfide	1500	6200		810	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Carbon Tetrachloride	5	5	5	0.46	2.5	U	25	U ^c	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Chlorobenzene	100	100	100	78	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Chlorodibromomethane	80	80		0.87	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Chloroethane	250	1200		21000	2.5	U	25	U	2.5	U	1	U ^c	50	U	1	U ^c	5	U	1	U	10	U	1	U
Chloroform	80	80		0.22	2.5	U	25	U	2.5	U	1	U	50	U	0.78	J	5	U	1	U	10	U	1	U
Chloromethane	30	30		190	2.5	U	25	U ^c	2.5	U	1	U	50	U	1	U	5	U	1	U ^c	10	U	1	U ^c
cis-1,2-Dichloroethene	70	70	70	36	27		25	U	380		230		5600		3400		38		17		50		28	
cis-1,3-Dichloropropene	7.3	34		0.47	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U ^c	10	U	1	U ^c
Ethylbenzene	700	700	700	1.5	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Methyl tert-butyl ether	20	20		14	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Methylene chloride	5	5		11	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Styrene	100	100	100	1200	2.5	U	25	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
Tetrachloroethene	5	5	5	11	370		260		120		120		1000		960	U	58		32	F1	1100		830	^c
Toluene	1000	1000	1000	1100	2.5	U	5	U	2.5	U	1	U	50	U	1	U	5	U	1	U	10	U	1	U
trans-1,2-Dichloroethene	100	100	100	360	2.5	U	5	U	2.5		1	U	50	U	1.7		5	U	1	U	10	U	1	U
trans-1,3-Dichloropropene	7.3	34		0.47	2.5	U	5	U	2.5	U	1	U ^c	50	U	1		5	U	1	U ^c	10	U	1	U
Trichloroethene	5	5	5	0.49	100	J	19	J	66		55		4000		2300		66		27	F1	370	J	210	
Vinyl Chloride	2	2	2	0.019	2.5	U	5	U	2.5	U	1	U	50	U	1	U	5	U	1	U ^c	10	U	1	U ^c
Xylenes (Total)	10000	10000	10000	190	5	U	50	U	5	U	2	U	100	U	2	U	10	U	2	U	22	U	20	U

Total VOC

^c - CCV recovery is outside acceptance limits.

U - Indicates the analyte was analyzed for but not detected.

J - Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

F1 - Matrix spike and/or matrix spike duplicate recovery is outside acceptance limits.

Table A-1.
2019 Groundwater Data Summary - Collection Wells
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

					SPBA Collection Wells											
Location/ID Sample Date Parameter	MSC UA R (ug/L)	MSC UA NR (ug/L)	Federal MCL (ug/L)	EPA RSL Tap Water (ug/L)	CW-21 9/26/2019	Qual	CW-21 12/18/2019	Qual	CW-22 9/26/2019	Qual	CW-22 12/18/2019	Qual	CW-23 9/26/2019	Qual	CW-23 12/18/2019	Qual
1,1,1,2-Tetrachloroethane	70	70		0.57	2.5	U	1	U	1	U	6	U	2	U	1	U
1,1,1-Trichloroethane	200	200	200	8000	2.5	U	1	U	1	U	6	U	2	U	1	U
1,1,2,2-Tetrachloroethane	0.84	4.3		0.076	2.5	U	1	U	1	U	6	U	2	U	1	U
1,1,2-Trichloroethane	5	5	5	0.28	2.5	U	1	U	1	U	6	U	2	U	1	U
1,1-Dichloroethane	31	160		2.8	2.5	U	1	U	1	U	6	U	2	U	1	U
1,1-Dichloroethene	7	7	7	280	2.5	U	1	U	10	U	6	U	2	U	1	U
1,2-Dibromoethane	0.05	0.05	0.05	0.0075	2.5	U	1	U	1	U	6	U	2	U	1	U
1,2-Dichloroethane	5	5	5	0.17	2.5	U	1	U	1	U	6	U	2	U	1	U
1,2-Dichloropropane	5	5	5	0.44	2.5	U	1	U	1	U	6	U	2	U	1	U
2-Butanone	4000	4000		5600	13	U	5	U ^c	5	U	30	U ^c	10	U	5	U ^c
2-Hexanone	63	260		38	13	U	5	U ^c	5	U	30	U ^c	10	U	5	U ^c
4-Methyl-2-Pentanone	3300	9300		6300	13	U	5	U ^c	5	U	30	U ^c	10	U	5	U ^c
Acetone	38000	110000		14000	13	U	5	U ^c	5	U	30	U ^c	10	U	5	U ^c
Acrylonitrile	0.72	3.7		0.052	50	U	20	U	200	U	120	U	40	U	20	U
Benzene	5	5	5	0.46	2.5	U	1	U	1	U	6	U	2	U	1	U
Bromochloromethane	90	90		83	2.5	U	1	U	1	U	6	U	2	U	1	U
Bromodichloromethane	80	80		0.13	2.5	U	1	U	1	U	6	U	2	U	1	U
Bromoform	80	80		3.3	2.5	U	1	U	1	U	6	U	2	U	1	U
Bromomethane	10	10		7.5	2.5	U	1	U	1	U	6	U	2	U	1	U
Carbon Disulfide	1500	6200		810	2.5	U	1	U	1	U	6	U	2	U	1	U
Carbon Tetrachloride	5	5	5	0.46	2.5	U	1	U	1	U	6	U	2	U	1	U
Chlorobenzene	100	100	100	78	2.5	U	1	U	1	U	6	U	2	U	1	U
Chlorodibromomethane	80	80		0.87	2.5	U	1	U	1	U	6	U	2	U	1	U
Chloroethane	250	1200		21000	2.5	U	1	U	1	U	6	U	2	U	1	U
Chloroform	80	80		0.22	2.5	U	1	U	1	U	6	U	2	U	1	U
Chloromethane	30	30		190	2.5	U	1	U ^c	1	U	6	U ^c	2	U	1	U ^c
cis-1,2-Dichloroethene	70	70	70	36	2.5	U	1	U	1	U	6	U	2	U	1	U
cis-1,3-Dichloropropene	7.3	34		0.47	2.5	U	1	U	1	U	6	U	2	U	1	U
Ethylbenzene	700	700	700	1.5	2.5	U	1	U	1	U	6	U	2	U	1	U
Methyl tert-butyl ether	20	20		14	2.5	U	1	U	1	U	6	U	2	U	1	U
Methylene chloride	5	5		11	2.5	U	1	U	1	U	6	U	2	U	1	U
Styrene	100	100	100	1200	2.5	U	1	U	1	U	6	U	2	U	1	U
Tetrachloroethene	5	5	5	11	260		230		110	J	100		42		37	
Toluene	1000	1000	1000	1100	2.5	U	1	U	1	U	6	U	2	U	1	U
trans-1,2-Dichloroethene	100	100	100	360	2.5	U	1	U	1	U	6	U	2	U	1	U
trans-1,3-Dichloropropene	7.3	34		0.47	2.5	U	1	U	1	U	6	U	2	U	1	U
Trichloroethene	5	5	5	0.49	3.5	J	1.6		3.3	J	6	U	2	U	1	U
Vinyl Chloride	2	2	2	0.019	2.5	U	1	U ^c	1	U	6	U	2	U	1	U
Xylenes (Total)	10000	10000	10000	190	5	U	2	U	2	U	12	U	4	U	2	U

Total VOC

^c - CCV recovery is outside acceptance limits.

U - Indicates the analyte was analyzed for but not detected.

J - Result is less than the reporting limit but greater than or equal to the method detection lim

F1 - Matrix spike and/or matrix spike duplicate recovery is outside acceptance limits.

TABLE A-2

WATER QUALITY ANALYSES

2019 PACKED TOWER AERATOR SAMPLES SUMMARY

Former York Naval Ordnance Plant

1425 Eden Road, York PA 17402

Sample ID Lab ID Sample Date Parameter	Units	Outfall #003 GW 9975349 1/28/2019	Outfall #003 GW 1040375 4/22/2019	Outfall #003 GW 1045295 4/29/2019	Outfall #003 GW 105415 5/6/2019	Outfall #003 RW 1103982 7/18/2019	Outfall #003 RW 1166618 10/3/2019
1,1-DICHLOROETHENE	ug/l	N.D.@0.2	N.D.@0.2	N.A.	N.A.	N.D.@0.2	N.D.@0.2
CIS 1,2-DICHLOROETHENE	ug/l	N.A.	0.27 J	0.14 J	0.12 J	N.A.	N.A.
TETRACHLOROETHENE	ug/l	N.D.@0.2	N.D.@0.2	N.A.	N.A.	N.D.@0.2	N.D.@0.2
TRICHLOROETHENE	ug/l	N.D.@0.2	N.D.@0.2	N.A.	N.A.	N.D.@0.2	N.D.@0.2
METHYLENE CHLORIDE	ug/l	N.D.@0.3	N.D.@0.3	N.A.	N.A.	N.D.@0.3	N.D.@0.3
VINYL CHLORIDE	ug/l	N.D.@0.3	N.D.@0.3	N.A.	N.A.	N.D.@0.3	N.D.@0.3
TOTAL VOCs	ug/l	0	0	0	0	0	0

Sample ID Lab ID Sample Date Parameter	Units	Influent to #003 GW 9975348 1/28/2019	Influent to #003 GW 1040374 4/22/2019	Influent to #003 RW 1103981 7/18/2019	Influent to #003 RW 1166617 10/3/2019
1,1,1-TRICHLOROETHANE	ug/l	71	78	64	72
1,1-DICHLOROETHANE	ug/l	5	5.8	5.9	6.8
1,1-DICHLOROETHENE	ug/l	17	17	15	16
1,2-DICHLOROETHANE	ug/l	N.D.@2	N.D.@0.5	N.D.@0.5	N.D.@0.5
CHLOROBENZENE	ug/l	N.D.@0.2	N.D.@0.5	N.D.@0.5	N.D.@0.5
CHLOROFORM	ug/l	N.D.@0.2	N.D.@0.5	N.D.@0.5	N.D.@0.5
METHYLENE CHLORIDE	ug/l	N.D.@0.2	N.D.@0.6	0.8 J	N.D.@0.6
TETRACHLOROETHENE	ug/l	280	300	370	500
TRICHLOROETHENE	ug/l	130	140	150	180
VINYL CHLORIDE	ug/l	1	N.D.@0.8	N.D.@0.8	N.D@0.8
CIS 1,2-DICHLOROETHENE	ug/l	210	180	140	130
TRANS 1,2-DICHLOROETHENE	ug/l	0.7 J	0.6 J	0.6 J	1.0 J
TOTAL VOCs	ug/l	713	721	745	905

Notes:

All Analysis Performed by Eurofins Lancaster Laboratories Environmental (ELLE) - Lancaster, PA

ug/l - micrograms per liter

J - Estimated value ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ or RL)

N.D.@1 - not detected at indicated concentration

PTA Infl. - Official sample name is "influent to #003 GWTS"

PTA Effl. - Official sample name is "outfall #003 GWTS"

N.A. - Parameter not analyzed

APPENDIX B

2019 Excel® Database Summary
Groundwater Treatment Plant Operations

Table B-1
2019 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
1/1/2019	1	23.9	1	23.9	358,866	6.529	1461	4	3	11.9	12.0
1/2/2019	1	23.9	1	23.9	361,474	6.537	1553	4	3	11.9	12.0
1/3/2019	2	23.9	1	23.9	357,456	6.537	1543	4	3	11.9	12.0
1/4/2019	1	23.9	1	23.9	357,307	6.535	1593	4	3	11.9	12.0
1/5/2019	1	23.9	1	23.9	357,114	6.537	1476	4	3	11.9	12.0
1/6/2019	1	23.9	1	23.9	356,806	6.539	1572	4	3	11.9	12.0
1/7/2019	1	23.9	1	23.9	356,072	6.521	1750	4	3	11.9	12.0
1/8/2019	1	23.9	1	23.9	355,852	6.538	1600	4	3	11.9	12.0
1/9/2019	1	23.9	1	23.9	356,047	6.522	1650	4	3	11.9	12.0
1/10/2019	1	23.9	1	23.9	355,892	6.522	1916	4	3	11.9	12.0
1/11/2019	1	23.9	1	23.9	354,534	6.521	1791	4	3	11.9	12.0
1/12/2019	1	23.9	1	23.9	354,205	6.522	1789	4	3	11.9	12.0
1/13/2019	1	23.9	1	23.9	353,719	6.523	1788	4	3	11.9	12.0
1/14/2019	1	23.9	1	23.9	351,478	6.525	1741	4	3	11.9	12.0
1/15/2019	1	23.9	1	23.9	348,388	6.523	1725	4	3	11.9	12.0
1/16/2019	1	23.9	1	23.9	348,579	6.524	1724	4	3	11.9	12.0
1/17/2019	1	23.9	1	23.9	349,165	6.524	1783	4	3	11.9	12.0
1/18/2019	1	23.9	1	23.9	351,604	6.524	1712	4	3	11.9	12.0
1/19/2019	1	23.9	1	23.9	347,943	6.525	1762	4	3	11.9	12.0
1/20/2019	1	23.9	1	23.9	349,476	6.525	1818	4	3	11.9	12.0
1/21/2019	2	23.9	2	23.9	350,144	6.524	1901	4	3	11.9	12.0
1/22/2019	1	23.9	1	23.9	351,755	6.525	1815	4	3	11.9	12.0
1/23/2019	1	23.9	1	23.9	351,352	6.527	1608	4	3	11.9	12.0
1/24/2019	1	23.9	1	23.9	352,742	6.524	1534	4	3	11.9	12.0
1/25/2019	1	23.9	1	23.9	353,305	6.525	1751	4	3	11.9	12.0
1/26/2019	1	23.9	1	23.9	352,983	6.525	1785	4	3	11.9	12.0
1/27/2019	1	23.9	1	23.9	352,364	6.525	1675	4	3	11.9	12.0
1/28/2019	1	23.9	1	23.9	351,678	6.526	1766	4	3	11.9	12.0
1/29/2019	1	23.9	1	23.9	350,783	6.517	1767	4	3	11.9	12.0
1/30/2019	1	23.9	1	23.9	350,412	6.514	1918	4	3	11.9	12.0
1/31/2019	1	23.9	1	23.9	350,034	6.512	1964	4	3	11.9	12.0
2/1/2019	1	23.9	1	23.9	349,522	6.511	1905	4	3	11.9	12.0
2/2/2019	1	23.9	1	23.9	346,960	6.511	1851	4	3	11.9	12.0
2/3/2019	1	23.9	1	23.9	347,668	6.513	1688	4	3	11.9	12.0
2/4/2019	1	23.9	1	23.9	349,625	6.510	1593	4	3	11.9	12.0
2/5/2019	1	23.9	1	23.9	348,550	6.512	1491	4	3	11.9	12.0
2/6/2019	1	23.9	1	23.9	349,675	6.495	1523	4	3	11.9	12.0
2/7/2019	1	23.9	1	23.9	349,673	6.511	1478	4	3	11.9	12.0
2/8/2019	1	23.9	1	23.9	349,385	6.513	1563	4	3	11.9	12.0
2/9/2019	1	23.9	1	23.9	349,253	6.507	1825	4	3	11.9	12.0
2/10/2019	1	23.9	1	23.9	349,244	6.528	1778	4	3	11.9	12.0
2/11/2019	1	23.9	1	23.9	349,622	6.511	1793	4	3	11.9	12.0
2/12/2019	1	23.9	1	23.9	348,029	6.520	1803	4	3	11.9	12.0
2/13/2019	1	23.9	1	23.9	349,201	6.496	1764	4	3	11.9	12.0
2/14/2019	1	23.9	1	23.9	346,322	6.497	1622	4	3	11.9	12.0
2/15/2019	1	23.9	1	23.9	347,673	6.496	1470	4	3	11.9	12.0
2/16/2019	1	23.9	1	23.9	347,901	6.514	1598	4	3	11.9	12.0
2/17/2019	1	23.9	1	23.9	347,200	6.529	1781	4	3	11.9	12.0
2/18/2019	1	23.9	1	23.9	347,477	6.509	1705	4	3	11.9	12.0
2/19/2019	1	23.9	1	23.9	348,046	6.511	1795	4	3	11.9	12.0
2/20/2019	1	23.9	1	23.9	350,093	6.496	1812	4	3	11.9	12.0
2/21/2019	1	23.9	1	23.9	351,993	6.511	1606	4	3	11.9	12.0
2/22/2019	1	23.9	1	23.9	352,433	6.527	1508	4	3	11.9	12.0
2/23/2019	1	23.9	1	23.9	353,440	6.516	1707	4	3	11.9	12.0
2/24/2019	1	23.9	1	23.9	354,612	6.500	1662	4	3	11.9	12.0
2/25/2019	1	23.9	1	23.9	354,184	6.512	1753	4	3	11.9	12.0
2/26/2019	1	23.9	1	23.9	351,788	6.511	1695	4	3	11.9	12.0
2/27/2019	1	23.9	1	23.9	351,379	6.509	1787	4	3	11.9	12.0
2/28/2019	1	23.9	1	23.9	352,852	6.509	1706	4	3	11.9	12.0
3/1/2019	1	23.9	1	23.9	352,263	6.512	1797	4	3	11.9	12.0
3/2/2019	1	23.9	1	23.9	352,811	6.524	1660	4	3	11.9	12.0
3/3/2019	1	23.9	1	23.9	351,664	6.532	1736	4	3	11.9	12.0
3/4/2019	1	23.9	1	23.9	352,225	6.515	1750	4	3	11.9	12.0
3/5/2019	1	23.9	1	23.9	352,888	6.517	1829	4	3	11.9	12.0
3/6/2019	1	23.9	1	23.9	352,439	6.510	1866	4	3	11.9	12.0
3/7/2019	1	23.9	1	23.9	351,780	6.511	1783	4	3	11.9	12.0

Table B-1
2019 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
3/8/2019	1	23.9	1	23.9	351,305	6.513	1763	4	3	11.9	12.0
3/9/2019	1	23.9	1	23.9	351,196	6.510	1618	4	3	11.9	12.0
3/10/2019	1	23.9	1	23.9	348,341	6.510	1464	4	3	11.9	12.0
3/11/2019	1	23.9	1	23.9	350,212	6.512	1513	4	3	11.9	12.0
3/12/2019	1	23.9	1	23.9	350,212	6.512	1537	4	3	11.9	12.0
3/13/2019	1	23.9	1	23.9	350,625	6.511	1781	4	3	11.9	12.0
3/14/2019	1	23.9	1	23.9	349,045	6.525	1464	4	3	11.9	12.0
3/15/2019	1	23.9	1	23.9	350,382	6.513	1415	4	3	11.9	12.0
3/16/2019	1	23.9	1	23.9	350,236	6.522	1464	4	3	11.9	12.0
3/17/2019	1	23.9	1	23.9	344,598	6.512	1488	4	3	11.9	12.0
3/18/2019	1	23.9	1	23.9	348,268	6.512	1757	4	3	11.9	12.0
3/19/2019	1	23.9	1	23.9	343,529	6.514	1488	4	3	11.9	12.0
3/20/2019	1	23.9	1	23.9	339,131	6.526	1562	4	3	11.9	12.0
3/21/2019	1	23.9	1	23.9	346,372	6.507	1513	4	3	11.9	12.0
3/22/2019	1	23.9	1	23.9	344,866	6.520	1464	4	3	11.9	12.0
3/23/2019	1	23.9	1	23.9	347,927	6.526	1781	4	3	11.9	12.0
3/24/2019	1	23.9	1	23.9	349,920	6.526	1757	4	3	11.9	12.0
3/25/2019	1	23.9	1	23.9	347,709	6.527	1440	4	3	11.9	12.0
3/26/2019	1	23.9	1	23.9	346,810	6.510	1488	4	3	11.9	12.0
3/27/2019	1	23.9	1	23.9	347,976	6.511	1757	4	3	11.9	12.0
3/28/2019	1	23.9	1	23.9	348,146	6.509	1513	4	3	11.9	12.0
3/29/2019	1	23.9	1	23.9	351,326	6.509	1430	4	3	11.9	12.0
3/30/2019	1	23.9	1	23.9	351,101	6.509	1410	4	3	11.9	12.0
3/31/2019	1	23.9	1	23.9	350,868	6.487	1468	4	3	11.9	12.0
4/1/2019	1	23.9	1	23.9	350,733	6.494	1637	4	3	11.9	12.0
4/2/2019	2	23.0	2	23.0	335,573	6.495	1518	7	6	11.7	11.4
4/3/2019	1	23.9	1	23.9	347,071	6.497	1479	4	3	11.9	12.0
4/4/2019	1	23.9	1	23.9	346,626	6.507	1401	4	3	11.9	12.0
4/5/2019	1	23.9	1	23.9	346,581	6.488	1439	4	3	11.9	12.0
4/6/2019	1	23.9	1	23.9	346,515	6.496	1416	4	3	11.9	12.0
4/7/2019	1	23.9	1	23.9	346,418	6.495	1391	4	3	11.9	12.0
4/8/2019	1	23.9	1	23.9	347,391	6.495	1343	4	3	11.9	12.0
4/9/2019	1	23.9	1	23.9	346,765	6.501	1328	4	3	11.9	12.0
4/10/2019	1	23.9	1	23.9	357,539	6.510	1378	4	3	11.9	12.0
4/11/2019	1	23.9	1	23.9	361,040	6.507	1431	4	3	11.9	12.0
4/12/2019	1	23.9	1	23.9	360,300	6.511	1418	4	3	11.9	12.0
4/13/2019	1	23.9	1	23.9	357,506	6.508	1357	4	3	11.9	12.0
4/14/2019	1	23.9	1	23.9	359,264	6.508	1375	4	3	11.9	12.0
4/15/2019	1	23.9	1	23.9	359,708	6.505	1467	4	3	11.9	12.0
4/16/2019	1	23.9	1	23.9	359,557	6.507	1431	4	3	11.9	12.0
4/17/2019	1	23.9	1	23.9	359,551	6.507	1423	4	3	11.9	12.0
4/18/2019	1	23.9	1	23.9	359,110	6.517	1392	4	3	11.9	12.0
4/19/2019	1	23.9	1	23.9	359,180	6.508	1338	4	3	11.9	12.0
4/20/2019	1	23.9	1	23.9	359,249	6.509	1346	4	3	11.9	12.0
4/21/2019	1	23.9	1	23.9	358,631	6.514	1385	4	3	11.9	12.0
4/22/2019	1	23.9	1	23.9	357,254	6.507	1382	4	3	11.9	12.0
4/23/2019	1	23.9	1	23.9	356,130	6.507	1358	4	3	11.9	12.0
4/24/2019	1	23.9	1	23.9	355,405	6.506	1349	4	3	11.9	12.0
4/25/2019	1	23.9	1	23.9	355,369	6.507	1381	4	3	11.9	12.0
4/26/2019	1	23.9	1	23.9	355,488	6.506	1407	4	3	11.9	12.0
4/27/2019	1	23.9	1	23.9	355,603	6.514	1432	4	3	11.9	12.0
4/28/2019	1	23.9	1	23.9	354,741	6.484	1432	4	3	11.9	12.0
4/29/2019	1	23.9	1	23.9	354,295	6.506	1453	4	3	11.9	12.0
4/30/2019	1	23.9	1	23.9	354,329	6.507	1381	4	3	11.9	12.0
5/1/2019	1	23.9	1	23.9	355,025	6.506	1398	4	3	11.9	12.0
5/2/2019	1	23.9	1	23.9	354,046	6.492	1361	4	3	11.9	12.0
5/3/2019	1	23.9	1	23.9	353,059	6.506	1355	4	3	11.9	12.0
5/4/2019	1	23.9	1	23.9	353,861	6.505	1368	4	3	11.9	12.0
5/5/2019	1	23.9	1	23.9	355,729	6.506	1391	4	3	11.9	12.0
5/6/2019	3	23.7	3	23.6	354,073	6.654	1354	4	4	11.6	12.0
5/7/2019	1	23.9	1	23.9	360,011	6.525	1345	4	3	11.9	12.0
5/8/2019	1	23.9	1	23.9	359,878	6.505	1348	4	3	11.9	12.0
5/9/2019	1	23.9	1	23.9	359,633	6.505	1381	4	3	11.9	12.0
5/10/2019	1	23.9	1	23.9	359,397	6.504	1348	4	3	11.9	12.0
5/11/2019	1	23.9	1	23.9	359,390	6.491	1360	4	3	11.9	12.0
5/12/2019	1	23.9	1	23.9	360,153	6.504	1458	4	3	11.9	12.0

Table B-1
2019 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
5/13/2019	1	23.9	1	23.9	361,176	6.495	1467	4	3	11.9	12.0
5/14/2019	1	23.9	1	23.9	361,989	6.530	1439	4	3	11.9	12.0
5/15/2019	2	21.1	2	21.1	319,439	6.677	1250	3	4	10.2	10.8
5/16/2019	1	23.9	1	23.9	361,939	6.688	1355	3	4	12.0	11.9
5/17/2019	1	23.9	1	23.9	361,328	6.675	1340	3	4	12.0	11.9
5/18/2019	1	23.9	1	23.9	361,096	6.671	1339	3	4	12.0	11.9
5/19/2019	1	23.9	1	23.9	361,149	6.661	1322	3	4	12.0	11.9
5/20/2019	1	23.9	1	23.9	360,614	6.671	1326	3	4	12.0	11.9
5/21/2019	1	23.9	1	23.9	360,215	6.660	1337	3	4	12.0	11.9
5/22/2019	1	23.9	1	23.9	359,671	6.664	1377	3	4	12.0	11.9
5/23/2019	1	23.9	1	23.9	359,173	6.645	1341	3	4	12.0	11.9
5/24/2019	1	23.9	1	23.9	358,751	6.668	1331	3	4	12.0	11.9
5/25/2019	1	23.9	1	23.9	358,437	6.645	1348	3	4	12.0	11.9
5/26/2019	1	23.9	1	23.9	357,768	6.630	1334	3	4	12.0	11.9
5/27/2019	1	23.9	1	23.9	357,113	6.630	1327	3	4	12.0	11.9
5/28/2019	1	23.9	1	23.9	357,037	6.629	1322	3	4	12.0	11.9
5/29/2019	1	23.9	1	23.9	356,111	6.627	1320	3	3	18.8	5.1
5/30/2019	1	23.9	1	23.9	355,631	6.630	1325	3	4	13.1	10.8
5/31/2019	1	23.9	1	23.9	354,869	6.631	1318	5	4	22.6	1.1
6/1/2019	1	23.9	1	23.9	354,693	6.626	1327	1	0	23.9	0.0
6/2/2019	3	16.8	3	16.7	247,259	6.631	966	6	3	8.5	7.9
6/3/2019	1	23.9	1	23.9	352,769	6.647	1351	4	3	11.9	12.0
6/4/2019	1	23.9	1	23.9	354,259	6.648	1362	4	3	11.9	12.0
6/5/2019	1	23.9	1	23.9	353,112	6.632	1325	4	3	11.9	12.0
6/6/2019	1	23.9	1	23.9	352,232	6.619	1300	4	3	11.9	12.0
6/7/2019	1	23.9	1	23.9	351,798	6.632	1313	4	3	11.9	12.0
6/8/2019	1	23.9	1	23.9	351,286	6.632	1319	4	3	11.9	12.0
6/9/2019	1	23.9	1	23.9	350,781	6.632	1319	4	3	11.9	12.0
6/10/2019	1	23.9	1	23.9	350,658	6.632	1313	4	3	11.9	12.0
6/11/2019	1	23.9	1	23.9	353,542	6.632	1316	4	3	11.9	12.0
6/12/2019	1	23.9	1	23.9	359,860	6.632	1334	4	3	11.9	12.0
6/13/2019	1	23.9	1	23.9	360,346	6.648	1343	4	3	11.9	12.0
6/14/2019	1	23.9	1	23.9	360,747	6.648	1355	4	3	11.9	12.0
6/15/2019	1	23.9	1	23.9	360,811	6.639	1356	4	3	11.9	12.0
6/16/2019	1	23.9	1	23.9	360,641	6.618	1332	4	3	11.9	12.0
6/17/2019	1	23.9	1	23.9	360,067	6.626	1327	4	3	11.9	12.0
6/18/2019	1	23.9	1	23.9	359,038	6.619	1332	4	3	11.9	12.0
6/19/2019	1	23.9	1	23.9	358,844	6.614	1322	4	3	11.9	12.0
6/20/2019	1	23.9	1	23.9	358,746	6.618	1319	4	3	11.9	12.0
6/21/2019	1	23.9	1	23.9	359,117	6.632	1331	4	3	11.9	12.0
6/22/2019	1	23.9	1	23.9	359,163	6.632	1341	4	3	11.9	12.0
6/23/2019	1	23.9	1	23.9	358,206	6.618	1341	4	3	11.9	12.0
6/24/2019	1	23.9	1	23.9	358,685	6.591	1341	4	3	11.9	12.0
6/25/2019	1	23.9	1	23.9	358,685	6.602	1341	4	3	11.9	12.0
6/26/2019	1	24.0	1	24.0	357,812	6.585	1332	4	3	12.0	12.0
6/27/2019	1	23.9	1	23.9	357,627	6.585	1336	4	3	11.9	12.0
6/28/2019	1	4.8	1	4.8	86,084	6.585	322	1	0	4.8	0.0
6/29/2019	2	20.0	2	0.0	297,708	6.584	1113	3	3	10.0	10.0
6/30/2019	1	23.9	1	23.9	358,685	6.602	1341	4	3	11.9	12.0
7/1/2019	1	23.9	1	23.9	357,291	6.616	1328	4	3	11.9	12.0
7/2/2019	1	23.9	1	23.9	356,620	6.599	1324	4	3	11.9	12.0
7/3/2019	1	23.9	1	23.9	356,373	6.591	1329	4	3	11.9	12.0
7/4/2019	1	23.9	1	23.9	361,313	6.616	1341	4	3	11.9	12.0
7/5/2019	1	23.9	1	23.9	363,775	6.615	1336	4	3	11.9	12.0
7/6/2019	1	23.9	1	23.9	354,600	6.619	1317	4	3	11.9	12.0
7/7/2019	1	23.9	1	23.9	354,684	6.615	1317	4	3	11.9	12.0
7/8/2019	1	23.9	1	23.9	355,444	6.630	1317	4	3	11.9	12.0
7/9/2019	1	23.9	1	23.9	355,333	6.616	1312	4	3	11.9	12.0
7/10/2019	1	23.9	1	23.9	355,234	6.598	1323	4	3	11.9	12.0
7/11/2019	1	23.9	1	23.9	355,210	6.627	1317	4	3	11.9	12.0
7/12/2019	1	24.0	1	24.0	355,174	6.600	1317	4	3	12.0	12.0
7/13/2019	1	23.9	1	23.9	354,242	6.622	1315	4	3	11.9	12.0
7/14/2019	1	23.9	1	23.9	354,092	6.583	1311	4	3	11.9	12.0
7/15/2019	1	23.9	1	23.9	353,629	6.592	1307	4	3	11.9	12.0
7/16/2019	1	23.9	1	23.9	352,968	6.585	1315	4	3	11.9	12.0
7/17/2019	1	23.9	1	23.9	352,059	6.584	1313	4	3	11.9	12.0

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Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
7/18/2019	1	23.9	1	23.9	351,681	6.583	1309	4	3	11.9	12.0
7/19/2019	1	23.9	1	23.9	351,614	6.568	1309	4	3	11.9	12.0
7/20/2019	1	23.9	1	23.9	351,485	6.553	1317	4	3	11.9	12.0
7/21/2019	1	23.9	1	23.9	351,693	6.568	1321	4	3	11.9	12.0
7/22/2019	2	23.9	2	23.8	351,842	6.598	1319	4	3	11.9	12.0
7/23/2019	1	23.9	1	23.9	352,452	6.614	1316	4	3	11.9	12.0
7/24/2019	1	23.9	1	23.9	352,338	6.647	1313	4	3	11.9	12.0
7/25/2019	1	23.9	1	23.9	352,116	6.629	1308	4	3	11.9	12.0
7/26/2019	1	23.9	1	23.9	351,880	6.643	1305	4	3	11.9	12.0
7/27/2019	1	23.9	1	23.9	351,660	6.583	1312	4	3	11.9	12.0
7/28/2019	1	23.9	1	23.9	351,388	6.569	1309	4	3	11.9	12.0
7/29/2019	1	23.9	1	23.9	351,179	6.569	1307	4	3	11.9	12.0
7/30/2019	6	16.1	2	16.0	236,345	6.534	920	4	2	7.9	8.0
7/31/2019	1	23.9	1	23.9	352,802	6.629	1319	4	3	11.9	12.0
8/1/2019	1	23.9	1	23.9	352,827	6.615	1315	4	3	11.9	12.0
8/2/2019	1	23.9	1	23.9	352,478	6.629	1317	4	3	11.9	12.0
8/3/2019	1	23.9	1	23.9	352,604	6.614	1323	4	3	11.9	12.0
8/4/2019	1	23.9	1	23.9	352,444	6.638	1324	4	3	11.9	12.0
8/5/2019	1	23.9	1	23.9	352,320	6.628	1320	4	3	11.9	12.0
8/6/2019	1	23.9	1	23.9	352,140	6.615	1319	4	3	11.9	12.0
8/7/2019	1	23.9	1	23.9	351,531	6.583	1315	4	3	11.9	12.0
8/8/2019	1	23.9	1	23.9	352,273	6.585	1319	4	3	11.9	12.0
8/9/2019	1	23.9	1	23.9	352,033	6.583	1314	4	3	11.9	12.0
8/10/2019	1	23.9	1	23.9	352,095	6.597	1326	4	3	11.9	12.0
8/11/2019	1	23.9	1	23.9	351,958	6.598	1328	4	3	11.9	12.0
8/12/2019	1	23.9	1	23.9	351,558	6.569	1317	4	3	11.9	12.0
8/13/2019	1	23.9	1	23.9	351,525	6.599	1308	4	3	11.9	12.0
8/14/2019	1	23.9	1	23.9	357,044	6.583	1316	4	3	11.9	12.0
8/15/2019	1	23.9	1	23.9	363,042	6.584	1320	4	3	11.9	12.0
8/16/2019	1	23.9	1	23.9	362,898	6.591	1319	4	3	11.9	12.0
8/17/2019	1	23.9	1	23.9	362,325	6.584	1324	4	3	11.9	12.0
8/18/2019	1	23.9	1	23.9	362,823	6.569	1332	4	3	11.9	12.0
8/19/2019	1	23.9	1	23.9	362,533	6.569	1328	4	3	11.9	12.0
8/20/2019	1	23.9	1	23.9	362,450	6.584	1335	4	3	11.9	12.0
8/21/2019	1	23.9	1	23.9	362,816	6.585	1330	4	3	11.9	12.0
8/22/2019	1	23.9	1	23.9	362,785	6.584	1328	4	3	11.9	12.0
8/23/2019	1	23.9	1	23.9	362,621	6.626	1334	4	3	11.9	12.0
8/24/2019	1	23.9	1	23.9	363,081	6.633	1348	4	3	11.9	12.0
8/25/2019	1	23.9	1	23.9	362,922	6.615	1349	4	3	11.9	12.0
8/26/2019	1	23.9	1	23.9	362,643	6.612	1340	4	3	11.9	12.0
8/27/2019	1	23.9	1	23.9	361,569	6.614	1332	4	3	11.9	12.0
8/28/2019	1	23.9	1	23.9	360,723	6.630	1334	4	3	11.9	12.0
8/29/2019	1	23.9	1	23.9	360,696	6.618	1332	4	3	11.9	12.0
8/30/2019	1	23.9	1	23.9	358,622	6.601	1333	3	3	12.0	12.0
8/31/2019	1	23.9	1	23.9	358,622	6.601	1333	3	3	12.0	12.0
9/1/2019	1	23.9	1	23.9	358,622	6.601	1333	3	3	12.0	12.0
9/2/2019	1	23.9	1	23.9	358,622	6.601	1333	3	3	12.0	12.0
9/3/2019	1	23.9	1	23.9	358,622	6.601	1333	3	3	12.0	12.0
9/4/2019	1	23.9	1	23.9	356,817	6.585	1310	4	3	11.9	12.0
9/5/2019	1	23.9	1	23.9	357,110	6.619	1324	4	3	11.9	12.0
9/6/2019	1	23.9	1	23.9	356,408	6.631	1326	4	3	11.9	12.0
9/7/2019	1	23.9	1	23.9	355,910	6.614	1331	4	3	11.9	12.0
9/8/2019	1	23.9	1	23.9	355,770	6.616	1327	4	3	11.9	12.0
9/9/2019	1	23.9	1	23.9	355,784	6.614	1323	4	3	11.9	12.0
9/10/2019	1	23.9	1	23.9	355,919	6.598	1323	4	3	11.9	12.0
9/11/2019	1	23.9	1	23.9	355,882	6.569	1321	4	3	11.9	12.0
9/12/2019	1	23.9	1	23.9	355,883	6.610	1326	4	3	11.9	12.0
9/13/2019	1	23.9	1	23.9	356,018	6.629	1330	4	3	11.9	12.0
9/14/2019	1	23.9	1	23.9	356,429	6.617	1342	4	3	11.9	12.0
9/15/2019	1	23.9	1	23.9	356,573	6.616	1340	4	3	11.9	12.0
9/16/2019	1	23.9	1	23.9	356,393	6.599	1328	4	3	11.9	12.0
9/17/2019	1	23.9	1	23.9	356,098	6.617	1332	4	3	11.9	12.0
9/18/2019	1	23.9	1	23.9	355,916	6.635	1338	4	3	11.9	12.0
9/19/2019	1	23.9	1	23.9	355,887	6.647	1348	4	3	11.9	12.0
9/20/2019	1	23.9	1	23.9	355,891	6.630	1371	4	3	11.9	12.0
9/21/2019	1	23.9	1	23.9	355,978	6.600	1368	4	3	11.9	12.0

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Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
9/22/2019	1	23.9	1	23.9	355,694	6.585	1354	4	3	11.9	12.0
9/23/2019	1	23.9	1	23.9	355,502	6.583	1350	4	3	11.9	12.0
9/24/2019	1	23.9	1	23.9	355,768	6.623	1358	4	3	11.9	12.0
9/25/2019	1	23.9	1	23.9	355,768	6.623	1358	4	3	11.9	12.0
9/26/2019	1	23.9	1	23.9	355,350	6.632	1361	4	3	11.9	12.0
9/27/2019	1	23.9	1	23.9	355,336	6.627	1362	4	3	11.9	12.0
9/28/2019	1	23.9	1	23.9	355,353	6.597	1352	4	3	11.9	12.0
9/29/2019	1	23.9	1	23.9	355,160	6.630	1349	4	3	11.9	12.0
9/30/2019	1	23.9	1	23.9	355,067	6.632	1351	4	3	11.9	12.0
10/1/2019	1	23.9	1	23.9	354,972	6.597	1352	4	3	11.9	12.0
10/2/2019	1	23.9	1	23.9	355,423	6.569	1339	4	3	11.9	12.0
10/3/2019	1	23.9	1	23.9	353,902	6.642	1353	4	3	11.9	12.0
10/4/2019	1	23.9	1	23.9	356,219	6.661	1381	4	3	11.9	12.0
10/5/2019	1	23.9	1	23.9	356,172	6.662	1408	4	3	11.9	12.0
10/6/2019	1	23.9	1	23.9	355,823	6.651	1386	4	3	11.9	12.0
10/7/2019	1	23.9	1	23.9	355,653	6.665	1361	4	3	11.9	12.0
10/8/2019	1	23.9	1	23.9	360,217	6.664	1390	4	3	11.9	12.0
10/9/2019	1	23.9	1	23.9	362,770	6.664	1407	4	3	11.9	12.0
10/10/2019	1	23.9	1	23.9	362,687	6.648	1405	4	3	11.9	12.0
10/11/2019	1	23.9	1	23.9	362,438	6.664	1395	4	3	11.9	12.0
10/12/2019	1	23.9	1	23.9	362,678	6.657	1409	4	3	11.9	12.0
10/13/2019	1	23.9	1	23.9	362,445	6.660	1432	4	3	11.9	12.0
10/14/2019	1	23.9	1	23.9	362,346	6.664	1397	4	3	11.9	12.0
10/15/2019	1	23.9	1	23.9	362,011	6.668	1406	4	3	11.9	12.0
10/16/2019	1	23.9	1	23.9	362,292	6.664	1410	4	3	11.9	12.0
10/17/2019	1	23.9	1	23.9	362,657	6.662	1460	4	3	11.9	12.0
10/18/2019	1	23.9	1	23.9	363,177	6.647	1450	4	3	11.9	12.0
10/19/2019	1	23.9	1	23.9	362,949	6.664	1489	4	3	11.9	12.0
10/20/2019	1	23.9	1	23.9	362,883	6.663	1448	4	3	11.9	12.0
10/21/2019	1	23.9	1	23.9	362,880	6.665	1412	4	3	11.9	12.0
10/22/2019	2	17.1	2	17.0	259,546	6.649	1050	4	2	9.0	8.0
10/23/2019	1	23.9	1	23.9	364,174	6.648	1433	4	3	11.9	12.0
10/24/2019	1	23.9	1	23.9	363,861	6.650	1437	4	3	11.9	12.0
10/25/2019	1	23.9	1	23.9	362,478	6.665	1430	4	3	11.9	12.0
10/26/2019	1	23.9	1	23.9	364,037	6.665	1444	4	3	11.9	12.0
10/27/2019	1	23.9	1	23.9	364,403	6.664	1408	4	3	11.9	12.0
10/28/2019	1	23.9	1	23.9	363,972	6.663	1410	4	3	11.9	12.0
10/29/2019	2	23.4	2	23.3	355,249	6.661	1393	6	5	10.9	12.3
10/30/2019	1	23.9	1	23.9	364,504	6.666	1420	3	4	12.0	11.9
10/31/2019	1	23.9	1	23.9	365,243	6.663	1394	3	4	12.0	11.9
11/1/2019	1	23.9	1	23.9	366,648	6.662	1492	3	4	12.0	11.9
11/2/2019	1	23.9	1	23.9	366,904	6.665	1608	3	4	12.0	11.9
11/3/2019	1	23.9	1	23.9	366,432	6.665	1595	3	4	12.0	11.9
11/4/2019	1	23.9	1	23.9	365,959	6.654	1581	3	4	12.0	11.9
11/5/2019	1	23.9	1	23.9	365,630	6.653	1473	3	4	12.0	11.9
11/6/2019	1	23.9	1	23.9	364,906	6.654	1499	3	4	12.0	11.9
11/7/2019	1	23.9	1	23.9	364,779	6.651	1496	3	4	12.0	11.9
11/8/2019	1	23.9	1	23.9	360,976	6.651	1700	3	4	12.0	11.9
11/9/2019	1	23.9	1	23.9	357,744	6.665	1745	3	4	12.0	11.9
11/10/2019	1	23.9	1	23.9	357,592	6.650	1618	3	4	12.0	11.9
11/11/2019	1	23.9	1	23.9	356,997	6.651	1526	3	4	12.0	11.9
11/12/2019	1	23.9	1	23.9	346,233	6.694	1659	3	4	12.0	11.9
11/13/2019	1	23.9	1	23.9	276,092	6.695	1663	3	4	12.0	11.9
11/14/2019	1	23.9	1	23.9	289,989	6.667	1617	3	4	12.0	11.9
11/15/2019	1	23.9	1	23.9	303,231	6.666	1623	3	4	12.0	11.9
11/16/2019	1	23.9	1	23.9	305,115	6.667	1736	3	4	12.0	11.9
11/17/2019	1	23.9	1	23.9	306,737	6.666	1751	3	4	12.0	11.9
11/18/2019	1	23.9	1	23.9	308,168	6.668	1563	3	4	12.0	11.9
11/19/2019	1	23.9	1	23.9	310,075	6.661	1436	3	4	12.0	11.9
11/20/2019	1	23.9	1	23.9	313,429	6.652	1457	3	4	12.0	11.9
11/21/2019	1	23.9	1	23.9	315,813	6.652	1482	3	4	12.0	11.9
11/22/2019	1	23.9	1	23.9	317,347	6.660	1469	3	4	12.0	11.9
11/23/2019	1	23.9	1	23.9	317,604	6.651	1660	3	4	12.0	11.9
11/24/2019	1	23.9	1	23.9	316,622	6.668	1663	3	4	12.0	11.9
11/25/2019	1	23.9	1	23.9	318,558	6.653	1551	3	4	12.0	11.9
11/26/2019	1	23.9	1	23.9	322,096	6.649	1531	3	4	12.0	11.9

Table B-1
2019 Groundwater Treatment Plant Operations Summary
Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Date	AST Blower Cycles	AST Blower Hours	AST Pump Cycles	AST Pump Hours	Discharge Flow (gallons)	Influent pH (S.U.)	GWTS KWH	Effluent Pump P1 Cycles	Effluent Pump P2 Cycles	Effluent Pump P1 Hours	Effluent Pump P2 Hours
11/27/2019	1	23.9	1	23.9	325,561	6.652	1439	3	4	12.0	11.9
11/28/2019	1	23.9	1	23.9	326,888	6.651	1502	3	4	12.0	11.9
11/29/2019	1	23.9	1	23.9	328,076	6.682	1722	3	4	12.0	11.9
11/30/2019	1	23.9	1	23.9	329,935	6.683	1679	3	4	12.0	11.9
12/1/2019	1	23.9	1	23.9	331,434	6.687	1756	3	4	12.0	11.9
12/2/2019	1	23.9	1	23.9	333,663	6.682	1742	3	4	12.0	11.9
12/3/2019	1	23.9	1	23.9	336,843	6.653	1695	3	4	12.0	11.9
12/4/2019	1	23.9	1	23.9	340,988	6.662	1728	3	4	12.0	11.9
12/5/2019	1	23.9	1	23.9	329,467	6.667	1664	3	4	12.0	11.9
12/6/2019	1	23.9	1	23.9	316,826	6.678	1570	3	4	12.0	11.9
12/7/2019	1	23.9	1	23.9	318,429	6.668	1669	3	4	12.0	11.9
12/8/2019	1	23.9	1	23.9	321,427	6.668	1689	3	4	12.0	11.9
12/9/2019	1	23.9	1	23.9	324,344	6.667	1549	3	4	12.0	11.9
12/10/2019	1	23.9	1	23.9	325,605	6.667	1488	3	4	12.0	11.9
12/11/2019	1	23.9	1	23.9	327,359	6.668	1773	3	4	12.0	11.9
12/12/2019	1	23.9	1	23.9	332,112	6.668	1788	3	4	12.0	11.9
12/13/2019	1	23.9	1	23.9	334,946	6.680	1786	3	4	12.0	11.9
12/14/2019	4	22.1	2	22.1	309,841	6.668	1442	3	5	11.5	10.6
12/15/2019	1	23.9	1	23.9	334,064	6.668	1579	4	3	11.9	12.0
12/16/2019	1	23.9	1	23.9	333,871	6.668	1789	4	3	11.9	12.0
12/17/2019	1	23.9	1	23.9	334,309	6.667	1783	4	3	11.9	12.0
12/18/2019	1	23.9	1	23.9	334,288	6.667	1902	4	3	11.9	12.0
12/19/2019	1	23.9	1	23.9	336,403	6.668	2034	4	3	11.9	12.0
12/20/2019	1	23.9	1	23.9	337,052	6.682	1907	4	3	11.9	12.0
12/21/2019	1	23.9	1	23.9	338,420	6.730	1830	4	3	11.9	12.0
12/22/2019	1	23.9	1	23.9	338,189	6.730	1735	4	3	11.9	12.0
12/23/2019	1	23.9	1	23.9	340,856	6.668	1672	4	3	11.9	12.0
12/24/2019	1	23.9	1	23.9	344,659	6.700	1705	4	3	11.9	12.0
12/25/2019	1	23.9	1	23.9	345,278	6.699	1727	4	3	11.9	12.0
12/26/2019	1	23.9	1	23.9	344,980	6.728	1638	4	3	11.9	12.0
12/27/2019	1	23.9	1	23.9	345,065	6.786	1507	4	3	11.9	12.0
12/28/2019	1	23.9	1	23.9	339,035	6.838	1616	4	3	11.9	12.0
12/29/2019	1	23.9	1	23.9	332,186	7.083	1610	4	3	11.9	12.0
12/30/2019	1	23.9	1	23.9	333,865	8.005	1503	4	3	11.9	12.0
12/31/2019	1	23.9	1	23.9	337,625	8.375	1514	4	3	11.9	12.0

APPENDIX C

2019 Operation and Maintenance Data Summary

Table C-1
2019 OPERATION AND MAINTENANCE DATA SUMMARY
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

TECHNICIAN		SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL
Date		1/10/2019	1/28/2019	2/8/20109	2/25/2019	3/12/2019	3/26/2019	4/8/2019	4/29/2019	5/6/2019	5/21/2019	6/3/2019	6/24/2019	7/8/2019	7/22/2019	8/5/2019	8/20/2019	9/5/2019	9/17/2019	10/3/2019	10/21/2019	11/7/2019	11/21/2019	12/5/2019	12/19/2019
PTA INFL. PUMP																								
Full Load = 17	AMPS	NM	10.9	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10.40	NM	11.10	NM	NM	NM	10.80	NM	NM	NM	NM
	FLOW RATE gpm	273	274	274	270	275	262	271	237	263	279	276	268	265	261	262	270	261	254	253	255	257	224	250	238
PTA BLOWER																									
Full Load = 24	AMP READINGS	NM	22.34	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	20.85	NM	21.37	NM	NM	NM	21.68	NM	NM	NM	NM
	PRESSURE inches water	16.4	16.9	15.9	16.1	16.4	16.7	15.7	16.5	15.8	15.5	15.3	15.5	15	15.2	14.9	15	15.3	15.2	15.2	15.6	15.7	16.3	15.8	16.9
TOWER PANEL																									
	VISUAL INSPECT	NA	OK	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA
	WARWICK SECURE	NA	OK	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA	NA	OK	NA	NA	NA	NA
TOWER SAMPLING																									
	AST EFFLUENT pH	7.54	NM	7.64	NM	7.8	NM	7.67	NM	7.66	NM	7.8	NM	7.79	NM	7.6	NM	7.8	NM	7.8	NM	7.5	NM	7.7	MN
	AST INFLUENT pH	6.51	6.52	6.44	6.49	6.3	6.58	6.37	6.51	6.34	6.7	6.6	6.61	6.39	6.65	6.5	6.58	6.5	6.61	6.5	6.68	6.3	6.65	6.6	6.68
REDUX CHEMICAL INJECTION																									
	LMI PUMP SPEED (%)	46	44	41	45	45	44	45	45	45	45	45	43	43	44	44	45	45	44	44	45	43	40	43	41
	LMI INJECTION RATE (milis/min)	13.7	12.5	12.7	13.3	13.2	13.2	13.2	13.2	20.6	11.1	13.1	12.8	13.2	11.8	11.1	13.2	13.4	13	13.1	13.1	13.4	11.5	12.5	12.8
WPL WELLS																									
	TOTAL FLOW RATE gpm	265	266	267	262	267	253	263	266	256	271	266	261	258	254	256	264	276	275	276	367	269	231	247	244
CW-9; Full Load = 5.5	AMPS	NM	3.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	3.53	NM	3.46	NM	NM	NM	3.48	NM	NM	NM	NM
CW-9	FLOW RATE gpm	56.9	57.6	56.1	56.1	57.5	55.1	55.2	55.4	54.5	56.9	54.6	53.3	55.5	54.5	51.2	51.5	52.0	50.2	52.1	51.5	52.0	52.0	52.8	52.5
CW-9	PRESSURE psi	6	6	6	6	6	6	6	6	5	6	5	5	5	5	5	5	5	5	5	6	5	6	5	6
CW-9	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-9	HIGH LEVEL ALARM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CW-13; Full Load = 11.5	AMPS	NM	9.02	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	9.07	NM	9.07	NM	NM	NM	9.04	NM	NM	NM	NM
CW-13	FLOW RATE gpm	53.3	49.0	49.1	50.8	50.4	49.9	48.7	45.8	46.3	46.0	43.6	42.7	39.9	38.5	38.9	38.7	36.2	34.9	36.0	35.6	35.1	36.3	35.9	35.4
CW-13	PRESSURE psi	58	62	62	60	62	63	63	63	64	64	64	65	66	66	66	66	68	68	68	68	78	68	68	70
CW-13	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-13	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-17; Full Load = 11.5	AMPS	NM	9.48	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	9.53	NM	9.67	NM	NM	NM	9.61	NM	NM	NM	NM
CW-17	FLOW RATE gpm	93.7	97.2	98.3	94.7	97	98	97.9	82.1	86.6	95.8	96.2	82.6	83.5	79.5	82.8	82.1	93.6	94.6	93.5	81.4	82.2	41.3	59.3	55.4
CW-17	PRESSURE psi	42	10	45	42	40	40	41	40	42	40	40	40	40	40	40	40	40	40	40	40	40	65	50	60
CW-17	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-17	HIGH LEVEL ALARM?	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	Y	Y
CW-15A; Full Load = 1.6	AMPS	NM	1.13	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	1.08	NM	1.09	NM	NM	NM	1.02	NM	NM	NM	NM
CW-15A	FLOW RATE gpm	2.3	2	2.6	2.8	3	3.1	2.9	2.6	2.8	2.7	2.5	2.2	2.3	2.2	2.1	2.1	3.6	5.2	5.1	5.4	5.9	4.5	4.8	5.4
CW-15A	PRESSURE psi	40	33	40	50	50	48	47	45	49	48	50	50	47	46	45	40	52	36	28	23	12	10	56	52
CW-15A	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-15A	HIGH LEVEL ALARM?	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	Y	N	Y	N	Y
CW-20 Full Load = 17.3	AMPS	NM	12.33	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	12.81	NM	13.28	NM	NM	NM	13.49	NM	NM	NM	NM
CW-20	FLOW RATE gpm	59.9	60.1	60.7	60.1	59.8	60.1	59.9	69.7	64.7	69.8	69.8	79.9	80	79.6	80.1	90.4	90	89.5	89.9	95	95.2	94.7	95.1	94.7
CW-20	PRESSURE psi	80	80	80	79	80	31	80	68	70	65	73	49	59	59	58	45	45	45	45	39	35	36	36	39
CW-20	CLEAN "Y" STRAINER	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-20	HIGH LEVEL ALARM?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
AST influent pressure	inches of water	10.7	10.7	10.2	10.5	10.6	11.1	10.4	10.7	10.4	10.3	10.1	10.5	9.9	9.8	9.4	9.3	9.7	9.7	9.8	10	10	10.5	10.3	11
GAC influent pressure	inches of water	8.9	9.1	8.5	8.7	8.8	9.4	8.9	9.1	8.9	8.7	8.6	8.8	8.4	8.3	7.9	7.9	8.1	8.1	8.1	8.3	8.3	8.5	8.6	9.1
AST pitot pressure	inches of water	0.3	0.3	0.3	0.29	0.29	0.29	0.29	0.3	0.27	0.28	0.27	0.25	0.27	0.25	0.28	0.27	0.27	0.27	0.28	0.28	0.3	0.3	0.3	0.33

Table C-1
2019 OPERATION AND MAINTENANCE DATA SUMMARY
Former York Naval Ordnance Plant
1425 Eden Road, York PA 17402

TECHNICIAN		SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL	SRL
Date		1/10/2019	1/28/2019	2/8/20109	2/25/2019	3/12/2019	3/26/2019	4/8/2019	4/29/2019	5/6/2019	5/21/2019	6/3/2019	6/24/2019	7/8/2019	7/22/2019	8/5/2019	8/20/2019	9/5/2019	9/17/2019	10/3/2019	10/21/2019	11/7/2019	11/21/2019	12/5/2019	12/19/2019
SPBA WELLS																								
	TOTAL FLOW RATE gpm	7.9	7.8	7.2	8.1	8.1	8.8	8.1	6.8	7.3	7.9	10.3	6.8	6.6	6.6	6.4	6.3	5.8	5.8	5.8	5.3	6.6	6.1	6.1	6.5
CW-21; Full Load = 5	AMPS	NM	2.93	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	2.59	NM	2.67	NM	NM	NM	2.61	NM	NM	NM	NM
CW-21	FLOW-RATE gpm	4.7	4.7	4.3	4.8	4.9	5.2	4.6	4.3	4.5	4.9	7.1	4.4	4.5	4.1	4.1	3.8	3.8	3.8	3.5	3.5	4.2	4.0	3.9	4.1
CW-21	PRESSURE psi	9.4	9	9.1	8.4	9	9.4	9.7	9.7	9.7	10.3	10.4	10.6	10.7	11	10.9	10.9	10.9	10.7	10.7	10.4	10	9.5	9.2	9.1
CW-21	TARGET LEVEL	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95.0
CW-21	TRANSDUCER READING	95	95	95	95	95	95	95	95	94.9	95	72.9	95.1	95	95	95	95	95	95	95	95	95	95	95	95.0
CW-21	PUMP SPEED %	76	76	74	75	76	76	76	75	76	77	80	76	76	75	75	74	74	74	74	73	74	74	74	75.0
CW-21	CLEAN TRANSDUCER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-21	WATER CLARITY	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CW-21	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-22; Full Load = 3.9	AMPS	NM	1.8	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	1.95	NM	1.92	NM	NM	NM	1.96	NM	NM	NM	NM
CW-22	FLOW-RATE gpm	1.8	1.6	1.6	2	2	1.9	1.7	1.8	1.8	1.9	2.2	1.6	1.7	1.7	1.9	1.7	1.6	1.6	1.6	1.9	1.9	1.7	1.8	1.8
CW-22	PRESSURE psi	9.4	9	9.1	8.4	9.1	9.4	9.7	9.8	9.8	10.3	10.4	11	11	11	11	11	11	10.9	11	10	10	9.5	9.2	9.1
CW-22	TARGET LEVEL	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97
CW-22	TRANSDUCER READING	97	97	97	97	97	97	97	97	97	97	97.1	97	97	97	97	97	97	97	97.1	97.0	97	97	97	97
CW-22	PUMP SPEED %	69	69	68	69	69	69	69	69	70	71	73	70	70	70	70	70	70	70	69	70	70	69	69	70.0
CW-22	CLEAN TRANSDUCER	NA	NA	MA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-22	WATER CLARITY	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CW-22	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
CW-23; Full Load = 3.9	AMPS	NM	1.85	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	1.63	NM	1.64	NM	NM	NM	1.59	NM	NM	NM	NM
CW-23	FLOW-RATE gpm	1.4	1.6	1.2	1.2	1.4	1.8	1.2	0.8	1.3	1.3	0.9	0.9	0.6	0.7	0.6	0.6	0.4	0.4	0.4	0.3	0.5	0.5	0.2	0.6
CW-23	PRESSURE psi	9.4	9	9	8.2	9	9.2	9.7	9.7	9.7	10.1	10.4	11	11	11	11	11	11	10.7	11	11	10	9.5	9.1	9.1
CW-23	TARGET LEVEL	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57.0
CW-23	TRANSDUCER READING	57	57	57	56.9	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57.0
CW-22	PUMP SPEED %	70	70	69	69	69	71	70	69	70	71	70	69	69	69	69	69	69	69	69	68	68	68	68	68.0
CW-23	CLEAN TRANSDUCER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-23	WATER CLARITY	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR
CW-23	HIGH LEVEL ALARM?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Notes: Y - Yes N - No NA - Not Applicable NM - Not Measured