

**Quarterly Operations Report
Third Quarter 2017**

**Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant
Bethpage, New York**

**Contract No. N40085-10-D-9409
Contract Task Order No. 0005**

December 2017

Prepared for:



Naval Facilities Engineering Command Mid-Atlantic
9324 Virginia Avenue
Norfolk, VA 23511

Prepared by:



**KOMAN Government Solutions, LLC
180 Gordon Drive, Suite 110
Exton PA, 19341
(610) 363-3000**

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Patrick Schauble
Program Manager

12/14/17

Date

Stephane Roy
Project Manager

12/14/17

Date



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Acronyms and Abbreviations

bgs	below ground surface
CTO	Contract Task Order
DAR	Division of Air Resources
DCA	dichloroethane
DCE	dichloroethene
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
FMS	Flow Monitoring Station
GOCO	Government Owned Contractor Operated
i.w.	inches of water column
KGS	KOMAN Government Solutions, LLC
NAVFAC	Naval Facilities Engineering Command Mid-Atlantic
Navy	U.S. Department of the Navy
NELAC	National Environmental Accreditation Conference
NG	Northrop Grumman
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PID	photoionization detector
scfm	standard cubic feet per minute
SVECS	soil vapor extraction containment system
SVEW	soil vapor extraction well
SVOC	semi-volatile organic compound
SVPM	soil vapor pressure monitor
TCA	trichloroethane
TCE	trichloroethene
TCL	target compound list
TtEC	Tetra Tech EC, Inc.
TtNUS	Tetra Tech NUS, Inc.

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
VC	vinyl chloride
VGAC	vapor-phase granular activated carbon
VOC	volatile organic compound

1.0 INTRODUCTION

KOMAN Government Solutions, LLC (KGS) has prepared this Quarterly Operations Report for the Third Quarter 2017 for the Soil Vapor Extraction Containment System (SVECS) at Site 1, Former Drum Marshalling Area, at the Naval Weapons Industrial Reserve Plant (NWIRP) in Bethpage, New York. This report has been prepared for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic, under Contract No. N40085-10-D-9409, Contract Task Order (CTO) No. 0005. This Third Quarter 2017 Operations Report details activities that occurred from July 2017 to September 2017. Data was collected, and operational activities were performed by KGS in accordance with the following documents:

- *Final Operation & Maintenance Plan for Soil Vapor Extraction Containment System Site 1, Former Drum Marshalling Yard at Naval Weapons Industrial Reserve Plant Bethpage, New York* prepared by Tetra Tech EC, Inc. (TtEC) in 2010, hereafter referred to as the “O&M Manual.”
- *Final Supplemental Offsite Soil Vapor Intrusion Monitoring Plan for the Soil Vapor Extraction Containment System, Site 1, Former Drum Marshalling Yard at Naval Weapons Industrial Reserve Plant, Bethpage, New York* prepared by Tetra Tech NUS, Inc. (TtNUS) in 2012.

1.1 Site Location

NWIRP Bethpage is located in east central Nassau County, Long Island, New York, approximately 30 miles east of New York City. In the late 1990s, the Navy's property totaled approximately 109.5 acres and was formerly a Government Owned Contractor-Operated (GOCO) facility that was operated by Northrop Grumman (NG) until September 1998. NWIRP Bethpage was bordered on the north, west, and south by property owned, or formerly owned, by NG that covered approximately 550 acres, and on the east by a residential neighborhood. The Navy currently retains approximately nine acres of the former NWIRP, including Site 1, which lies within the fenced area of NWIRP Bethpage and is located east of Plant No. 3, west of 11th Street, and north of Plant 17 South (**Figures 1 and 2**).

1.2 Background

NWIRP Bethpage was established in 1943. Since inception, the primary mission of the facility was the research, prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. Historical operations that resulted in hazardous material generation at the facility included metal finishing processes, maintenance operations, painting of aircraft and components, and other activities that involve aircraft manufacturing. Wastes generated by plant operations were disposed of directly into drainage sumps, dry wells, and/or on the ground surface, resulting in the disposal of a number of hazardous wastes, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and inorganic analytes (chromium and cadmium) at the site. Some of these contaminants have migrated from the source area to surrounding areas, including the soils at these sites and the groundwater beneath and downgradient of the NWIRP Bethpage property. NWIRP Bethpage is currently listed by the New York State Department of Environmental Conservation (NYSDEC) as an “inactive hazardous waste site” (#1-30-003B).

Soils at Site 1 consist mainly of unconsolidated sediments that overlie crystalline bedrock. A clay unit is present near the groundwater table (50 feet below ground surface [bgs]) at the southeast corner of the site. This clay unit is suspected to be a source of chlorinated solvents that are migrating into the overlying soil gas and the source of off-site VOCs in soil vapor (TtEC 2010).

Chlorinated solvents including trichloroethene (TCE), tetrachloroethene (PCE), and 1,1,1-trichloroethane (TCA) have been identified as the VOCs of interest in soil gas at the site. Concentrations greater than 1,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of soil vapor have been directly associated with Site 1 activities and historical environmental data, and based on preliminary screening, exceed guidelines established by the New York State Department of Health (NYSDOH) for sub-slab soil vapor concentrations at the time. Of these compounds, TCE is the primary VOC of concern. Mitigation of TCE contamination in accordance with NYSDOH guidance is expected to remediate other VOCs associated with the site. PCBs, cadmium, and chromium have also been identified in site soils at concentrations requiring remediation. The majority of these chemicals has been detected in the central portion of Site 1 and will be addressed via a separate remediation (TtEC 2010).

Prior to implementation of the SVECS, the mean concentrations of VOCs in soil gas samples collected along the eastern fence-line were 41,128 $\mu\text{g}/\text{m}^3$ of TCE, 381 $\mu\text{g}/\text{m}^3$ of PCE, and 20,634 $\mu\text{g}/\text{m}^3$ of 1,1,1-TCA. The maximum concentrations of VOCs in the soil gas samples were 180,000 $\mu\text{g}/\text{m}^3$ of TCE, 1,200 $\mu\text{g}/\text{m}^3$ of PCE, and 90,000 $\mu\text{g}/\text{m}^3$ of 1,1,1-TCA (TtEC 2010).

1.3 Project Overview and Objective

The remedial objective for this project is to use an on-site soil vapor extraction system to prevent further off-site migration of VOC-contaminated soil vapor and to the extent practical, capture contaminated soil vapor with a TCE concentration greater than 250 $\mu\text{g}/\text{m}^3$. A secondary objective of this project is to address soil vapor with a TCE concentration greater than 5 $\mu\text{g}/\text{m}^3$. The SVECS is an interim action intended to address migration of VOCs in contaminated soil vapors. It is expected to operate continuously 24 hours/day, seven days/week, with the exception of maintenance and adjustment periods, until the remedial objectives are met (TtEC 2010).

1.4 SVECS Overview

The SVECS consists of soil vapor extraction, soil vapor monitoring, and soil vapor treatment. Twelve SVE wells (SVEWs) are located along the eastern boundary of Site 1 in six clusters, each consisting of one intermediate well and one deep well. Intermediate wells SVE-101I, SVE-102I, SVE-103I, SVE-104I, SVE-105I, and SVE-106I have a screened interval between 25 and 35 ft bgs. Deep wells SVE-101D, SVE-102D, SVE-103D, SVE-104D, SVE-105D, and SVE-106D have a screened interval between 40 and 60 ft bgs. The groundwater table fluctuates between approximately 50 and 55 feet bgs. Each SVEW is operated at a flow rate such that the combined total flow rate is approximately 300-400 standard cubic feet per minute (scfm) of soil vapor. Each intermediate depth SVEW requires an approximate vacuum of 4 inches of water column (i.w.) and each deep SVEW requires a vacuum of up to 20 i.w. in order to extract the targeted flow rates. These 12 SVEWs have been piped below the ground to the Flow Monitoring Station (FMS), where flow, vacuum, and vapor quality are monitored. Within the FMS, the

discharges from the individual SVEWs have been equipped with a 2-inch flow control butterfly valve, a vacuum gauge, and a sampling port. The sampling port is utilized to measure the flow rate from an individual well using a portable velocity meter and to collect vapor samples. All the SVE lines collect into a single manifold within the FMS and from this location a single underground pipeline has been routed approximately 1,400 linear feet to the Treatment Building (Building 03-35). Five additional SVEWs (SV-107D, SV-108D, SV-109D, SV-110D, and SV-111D) were installed in October 2011 to address potential VOCs under Plant No. 3 and the South Warehouse. A site plan depicting well locations is included as **Figure 3**.

The SVECS is housed within the Treatment Building, an existing and unoccupied building also known as Building 03-35. The treatment system consists of a moisture separator, two SVE blowers, and a 5,000-pound vapor-phase granular activated carbon (VGAC) unit for removal of chlorinated VOCs from the off-gas. Soil vapor that enters the Treatment Building first passes through the moisture separator tank where any condensate is separated. To date, no condensate has formed in this tank. The vapor is then passed through an air filter and SVE blower and then treated in the VGAC unit. The treated vapor is discharged from the VGAC via an exhaust stack. The SVECS has a control panel comprised of mechanical interlocks and relays for local operation. A System Layout Plan is presented in **Figure 4**, which also illustrates the design flow rates through the soil vapor extraction and treatment process.

The off-gas from the SVECS is monitored for chlorinated VOCs as identified in the NYSDEC Division of Air Resources (DAR) permit equivalent effluent limitations and updated approval documentation (**Appendix A**) and monitoring requirements (TtEC 2010). Samples are submitted to a National Environmental Laboratory Accreditation Conference (NELAC)-accredited, Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory, Air Toxics, Inc. located in Folsom, CA, for analysis of VOCs by modified method TO-15. Prior to January 2014, samples were analyzed for target compound list (TCL) VOCs. As of January 2014, upon approval by NYSDEC and NYSDOH, samples are analyzed for site-specific VOCs. The site-specific VOCs are: 1,1,1-TCA, 1,1-dichloroethane (DCA), 1,1-dichloroethene (DCE), 1,2-DCA, cis-1,2-DCE, PCE, trans-1,2-DCE, TCE, and vinyl chloride (VC).

A total of 18 soil vapor pressure monitor (SVPM) / soil gas monitoring points have been installed in the neighborhood east of Site 1 at NWIRP Bethpage (**Figure 3**). These off-site monitoring points consist of eight previously existing SVPMs as well as 10 SVPMs installed in September 2012. Soil vapor pressure readings from the SVPMs are collected quarterly and used to evaluate the SVECS vacuum field. In addition, analytical results of vapor samples collected annually from these locations and the soil vapor pressure readings are used to further evaluate the SVECS operation and the potential for vapor intrusion.

2.0 SVECS OPERATION AND MAINTENANCE

While designed to run autonomously, the SVECS requires regular visits by an operator to record and adjust operational parameters and to perform scheduled maintenance. The SVECS is equipped with telemetry that will alert an on-call operator in the event of a plant shutdown.

2.1 Routine Maintenance Activities

Routine maintenance activities at the SVECS were performed during the operator's weekly visits during this reporting period. These activities include general site inspections (of the grounds, buildings, doors and locks), collection of operational data (vapor flowrates, pressures, vacuums, temperature and photoionization detector [PID] readings), adjustment of system valves, collection of vapor samples (on a monthly and quarterly basis), collection/disposal of condensate if needed, cleaning of filters, switching of lead/lag blower assignments, and preventive maintenance of system equipment.

2.2 Non-routine Maintenance / Site Activities

The following non-routine activities / repair activities occurred at the SVECS during this quarterly reporting period:

- On 10 September, the backup battery for the fire alarm system was replaced at the main SVE building.

3.0 SVECS MONITORING

Several process vapor samples are collected on a monthly basis to monitor the SVECS operation. These samples consist of an influent sample (as well as a duplicate sample), located immediately prior to the VGAC unit, and an effluent sample, located after the VGAC unit and before the exhaust stack. Vapor samples are also collected from the 12 original SVEWs on a quarterly basis to monitor the capture of the contaminated soil vapor by the SVEWs. In addition, quarterly pressure measurements are collected from the 12 SVEWs and the 18 SVPs to monitor the SVECS vacuum field, and soil gas sampling from the 18 SVPs is conducted annually (generally in the winter time-frame) to evaluate the effectiveness of the SVECS. The first annual soil gas sampling event was conducted in the winter 2012-2013. The fifth annual sampling event was conducted in January 2017.

3.1 Monthly Air Quality Monitoring

Analysis of influent and effluent vapor sample locations is performed to evaluate VOC mass removal and the effectiveness of the VGAC adsorption unit. Time-integrated vapor samples are collected using 6-liter summa canisters with 30-minute flow regulators.

Treated off-gas discharged at the exhaust stack is subject to emissions limitations. Initially, discharge goals were derived from calculations submitted by the Navy and accepted by the NYSDEC in its February 2010 DAR permit equivalent application. In September 2011, the Navy submitted an evaluation proposing revised discharge goals (TtNUS 2011), which NYSDEC agreed to in October 2011. A copy of this documentation is included as **Appendix A**.

A summary of monthly vapor sampling results collected in July, August, and September (Third Quarter) is presented in **Tables 1, 2, and 3**, respectively. Emission rate calculations for both the influent stream (prior to VGAC treatment) and effluent stream (following VGAC treatment) and the computed monthly mass recoveries are also presented. Emission rates of the influent stream as well as mass recovery are calculated to monitor progress and determine when influent concentrations have reached levels at which vapor treatment via carbon adsorption is no longer required. The data presented in **Tables 1, 2, and 3** demonstrate that all constituents were within the effluent emission rate guidelines (**Appendix A**). Raw analytical data is provided under a separate cover.

3.2 Quarterly Air Quality Monitoring of SVEWs

Time-integrated vapor samples are collected quarterly using 6-liter summa canisters with 30-minute flow regulators at six intermediate and six deep SVEWs. The samples are collected for the purpose of tracking and documenting the performance of the SVECS (TtEC 2010).

Quarterly vapor samples were collected on 15 August from the 12 SVEWs. A summary of detected compounds is included as **Table 4**. Analytical results of select VOCs (1,1,1-TCA, PCE, and TCE) detected at the 12 SVEWs during the Third Quarter monitoring event are presented graphically in

Figure 5. Raw analytical data is provided under a separate cover. Historical analytical results of quarterly vapor samples collected from December 2009 through the Third Quarter 2017 are presented in **Table 5**.

3.3 Quarterly Soil Vapor Pressure Monitoring of SVEWs and Off-site SVPMs

Soil vapor pressure readings are collected quarterly from the 12 SVEWs and 18 SVPMs to monitor the SVECS vacuum field. Soil vapor pressure readings from the 12 SVEWs and 18 SVPMs were collected on 15 August. Results of the Third Quarter vapor monitoring are presented in **Table 6**.

The vapor pressure readings collected from the SVEWs ranged between -3.0 to -11.0 i.w. indicating that a vacuum has been established along the fence line. The vapor pressure readings collected from the SVPMs ranged between -0.01 to -0.07 i.w. indicating that a vacuum has been established in the residential neighborhood. Pressure readings from the 18 SVPMs are presented graphically in **Figure 6**.

3.4 Annual Vapor Quality Monitoring of Off-site SVPMs

Time-integrated vapor samples are collected annually using 6-liter summa canisters with 30-minute flow regulators at 18 SVPM locations. The 2017 analytical results are in the *Quarterly Operations Report First Quarter 2017*

3.5 Soil Vapor Quality Concentration Trends

Historical vapor analytical results for the 12 SVEWs through the Third Quarter are presented in **Table 5**. In addition, concentration trends of select VOCs for the SVECS combined influent (1,1,1-TCA, PCE, TCE, and total VOCs) and each of the 12 SVEWs (1,1,1-TCA, PCE, and TCE) are presented in **Appendix B**. Concentration trends observed in the 12 SVEWs through the Third Quarter are discussed below.

- Combined Influent: Overall VOC concentrations in the combined influent increased consistently throughout all three months of the Third Quarter 2017, with total VOC concentrations of 2,025 $\mu\text{g}/\text{m}^3$, 2,679 $\mu\text{g}/\text{m}^3$, and 2,928 $\mu\text{g}/\text{m}^3$ in July, August, and September, respectively. Overall, TCE, PCE and 1,1,1-TCA concentrations remain below baseline concentrations observed in December 2009 (42,000 $\mu\text{g}/\text{m}^3$ TCE, 7,900 $\mu\text{g}/\text{m}^3$ PCE, and 13,000 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).
- SV-101I: Concentrations observed at this location (7,600 $\mu\text{g}/\text{m}^3$ TCE, 87 $\mu\text{g}/\text{m}^3$ PCE, and 2,700 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increase in the Third Quarter from concentrations observed in the Second Quarter 2017. All concentrations remain below baseline concentrations observed in December 2009 (180,000 $\mu\text{g}/\text{m}^3$ TCE, 1,700 $\mu\text{g}/\text{m}^3$ PCE, and 51,000 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).
- SV-101D: Concentrations observed at this location (1,100 $\mu\text{g}/\text{m}^3$ TCE, 250 $\mu\text{g}/\text{m}^3$ PCE, and 22 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increase in the Third Quarter from concentrations observed in the Second Quarter 2017. All concentrations remain below baseline concentrations observed in December 2009 (100,000 $\mu\text{g}/\text{m}^3$ and 26,000 $\mu\text{g}/\text{m}^3$, respectively).

- SV-102I: Concentrations observed at this location (74 $\mu\text{g}/\text{m}^3$ TCE, 7.8 $\mu\text{g}/\text{m}^3$ PCE, and 6.4 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from the Second Quarter 2017. All concentrations are above baseline concentrations observed in December 2009, but below the maximum observed to date (300 $\mu\text{g}/\text{m}^3$ TCE, 17 $\mu\text{g}/\text{m}^3$ PCE, and 13 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) in June 2010.
- SV-102D: Concentrations observed at this location (80 $\mu\text{g}/\text{m}^3$ TCE, 17 $\mu\text{g}/\text{m}^3$ PCE, and 3.6 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from concentrations observed in the Second Quarter 2017. Concentrations remain below baseline concentrations observed in December 2009 for TCE and 1,1,1-TCA (440 $\mu\text{g}/\text{m}^3$ TCE and 130 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA). The concentration of PCE is above the baseline concentration observed in December 2009 (10 $\mu\text{g}/\text{m}^3$ PCE) but below the maximum observed to date (51 $\mu\text{g}/\text{m}^3$ in September 2016).
- SV-103I: Concentrations observed at this location (63 $\mu\text{g}/\text{m}^3$ TCE, 180 $\mu\text{g}/\text{m}^3$ PCE, and 6.0 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from concentrations observed in the Second Quarter 2017. Concentrations remain below baseline concentrations observed in December 2009 (900 $\mu\text{g}/\text{m}^3$ TCE, 580 $\mu\text{g}/\text{m}^3$ PCE, and 900 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).
- SV-103D: Concentrations observed at this location (440 $\mu\text{g}/\text{m}^3$ TCE, 6,800 $\mu\text{g}/\text{m}^3$ PCE, and 22 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) in the Third Quarter were consistent with concentrations observed in the Second Quarter 2017 (320 $\mu\text{g}/\text{m}^3$ TCE, 7,500 $\mu\text{g}/\text{m}^3$ PCE, and 23 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA). All concentrations remain below baseline concentrations observed in December 2009 (3,100 $\mu\text{g}/\text{m}^3$ TCE, 20,000 $\mu\text{g}/\text{m}^3$ PCE, and 3,000 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).
- SV-104I: Concentrations observed at this location (87 $\mu\text{g}/\text{m}^3$ TCE, 190 $\mu\text{g}/\text{m}^3$ PCE, and 7.8 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from concentrations observed in the first half of 2017. All concentrations remain below baseline concentrations observed in December 2009 (710 $\mu\text{g}/\text{m}^3$ TCE, 3,100 $\mu\text{g}/\text{m}^3$ PCE, and 730 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).
- SV-104D: Concentrations observed at this location (980 $\mu\text{g}/\text{m}^3$ TCE, 5,900 $\mu\text{g}/\text{m}^3$ PCE, and 390 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from concentrations observed in the first half of 2017. All concentrations remain below baseline concentrations observed in December 2009 (4,600 $\mu\text{g}/\text{m}^3$ TCE, 20,000 $\mu\text{g}/\text{m}^3$ PCE, and 3,600 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).
- SV-105I: Concentrations observed at this location (140 $\mu\text{g}/\text{m}^3$ TCE, 50 $\mu\text{g}/\text{m}^3$ PCE, and 13.0 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from concentrations observed in the first half of 2017. PCE remains below the baseline concentration observed in December 2009 (70 $\mu\text{g}/\text{m}^3$) while TCE and 1,1,1-TCA are above baseline concentrations but remain well below their maximum concentrations (370 $\mu\text{g}/\text{m}^3$ TCE in June 2010 and 30 $\mu\text{g}/\text{m}^3$ for 1,1,1-TCA in October 2015).
- SV-105D: Concentrations observed at this location (310 $\mu\text{g}/\text{m}^3$ TCE, 120 $\mu\text{g}/\text{m}^3$ PCE, and 33 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) generally increased in the Third Quarter from concentrations observed in the first half of 2017. These concentrations are below baseline concentrations observed in December 2009 (1,700 $\mu\text{g}/\text{m}^3$ TCE, 2,100 $\mu\text{g}/\text{m}^3$ PCE, and 550 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).

- SV-106I: Concentrations observed at this location (170 $\mu\text{g}/\text{m}^3$ TCE, 16 $\mu\text{g}/\text{m}^3$ PCE, and 11 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from concentrations observed in the first half of 2017. These concentrations are below baseline concentrations observed in December 2009 (1,900 $\mu\text{g}/\text{m}^3$ TCE, 390 $\mu\text{g}/\text{m}^3$ PCE, and 220 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).
- SV-106D: Concentrations observed at this location (300 $\mu\text{g}/\text{m}^3$ TCE, 44 $\mu\text{g}/\text{m}^3$ PCE, and 18 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA) increased in the Third Quarter from concentrations observed in the first half of 2017. These concentrations are below baseline concentrations observed in December 2009 (3,400 $\mu\text{g}/\text{m}^3$ TCE, 720 $\mu\text{g}/\text{m}^3$ PCE, and 340 $\mu\text{g}/\text{m}^3$ 1,1,1-TCA).

4.0 CONCLUSIONS AND RECOMMENDATIONS

As stated previously, the intent of the Site 1 SVECS is to prevent further off-site migration of VOC contaminated soil vapor and to the extent practical, capture soil vapor with elevated TCE concentrations. Based on the presence of a vacuum field and the reduction of VOC concentrations to less than the screening values in the off-property area, the SVECS is functioning as designed. Influent vapor analytical data with concentrations of TCE above the project action level (greater than 250 µg/L) indicates that the SVECS should continue to be operated on a full-time basis to achieve continued capture of contaminated soil vapor. Monthly monitoring of the combined influent and effluent as well as quarterly monitoring of individual SVEWs should continue. Quarterly and annual monitoring of the SVPMs should also continue in order to ensure that a measurable vacuum field is being established and that the area is being effectively treated. In addition, further investigation will be conducted by others to further evaluate recent increasing concentration trends in SVPM-2006I and SVPM-2006D and to determine if another source of VOCs in soil vapor is present.

5.0 REFERENCES

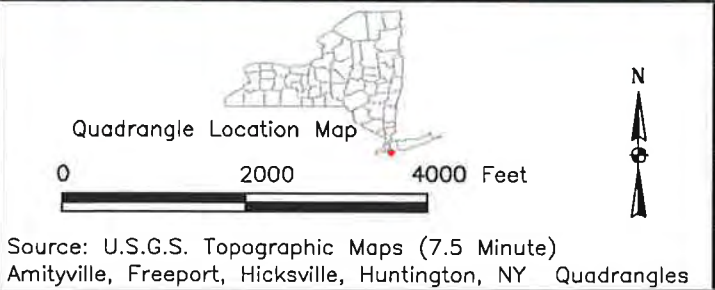
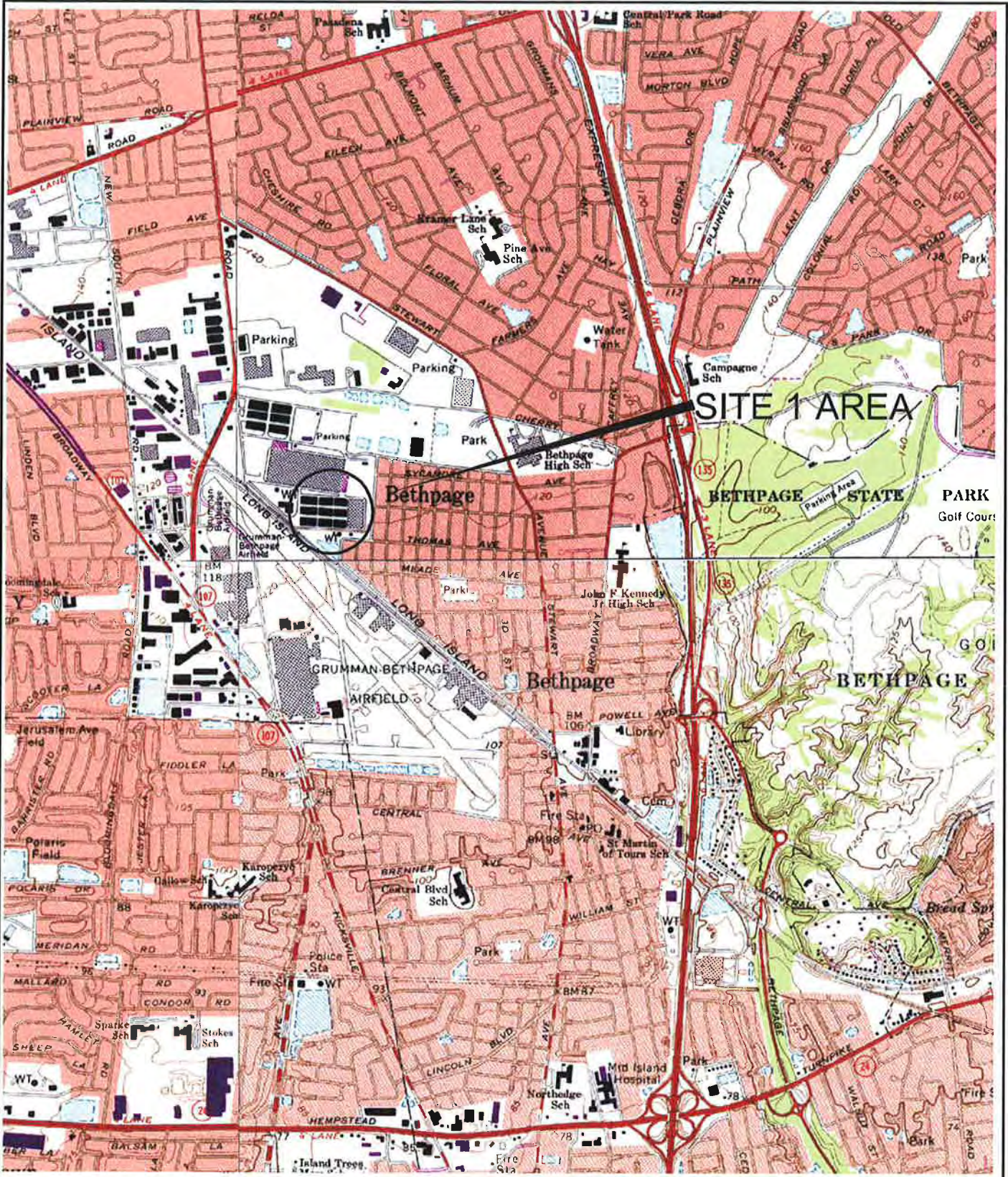
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FIGURES



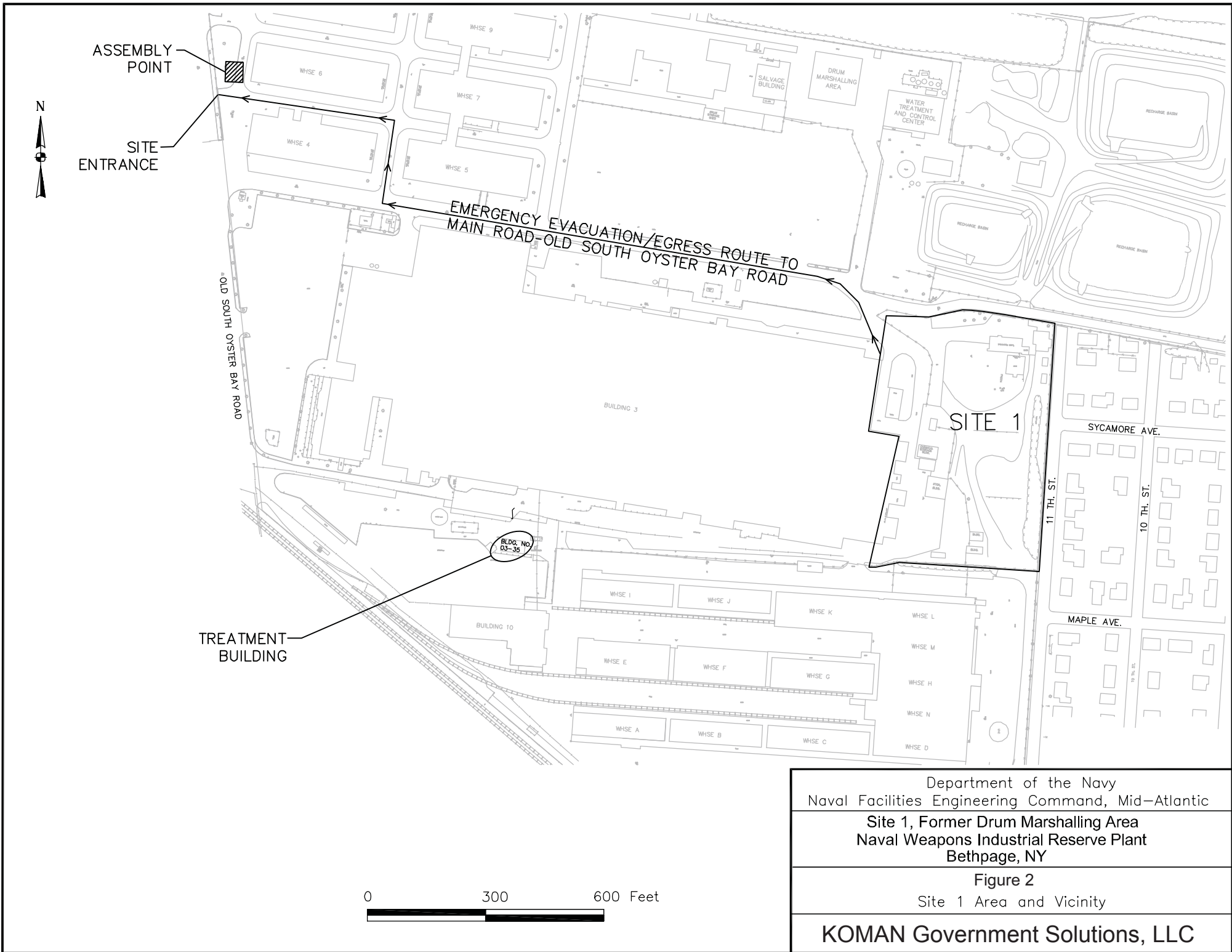
Department of the Navy
 Naval Facilities Engineering Command, Mid-Atlantic

Site 1, Former Drum Marshalling Area
 Naval Weapons Industrial Reserve Plant
 Bethpage, NY

Figure 1: Site Location Map

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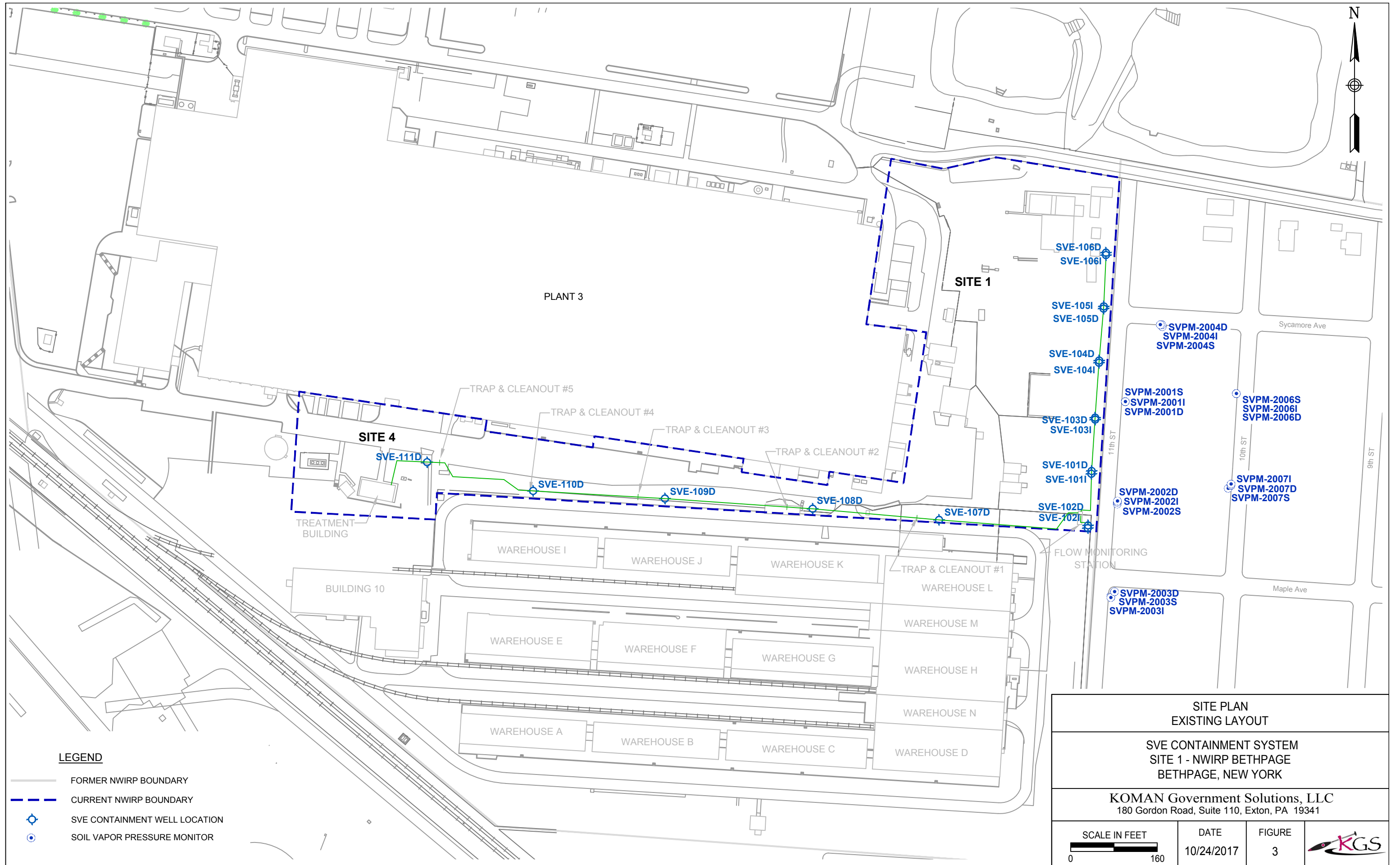
Source: U.S.G.S. Topographic Maps (7.5 Minute)
 Amityville, Freeport, Hicksville, Huntington, NY Quadrangles

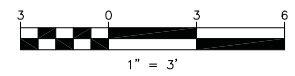
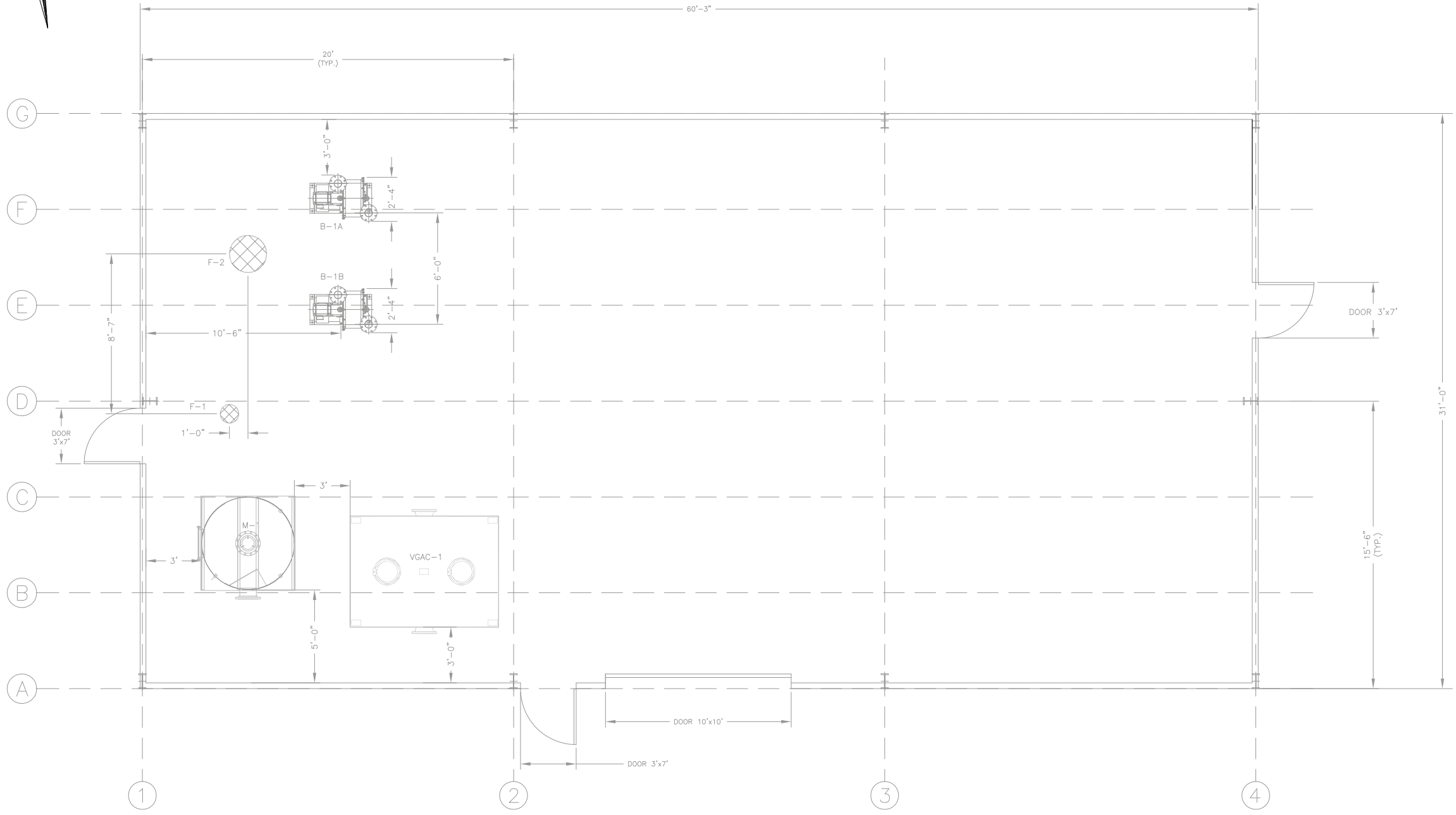


Department of the Navy
 Naval Facilities Engineering Command, Mid-Atlantic
 Site 1, Former Drum Marshalling Area
 Naval Weapons Industrial Reserve Plant
 Bethpage, NY

Figure 2
 Site 1 Area and Vicinity

KOMAN Government Solutions, LLC

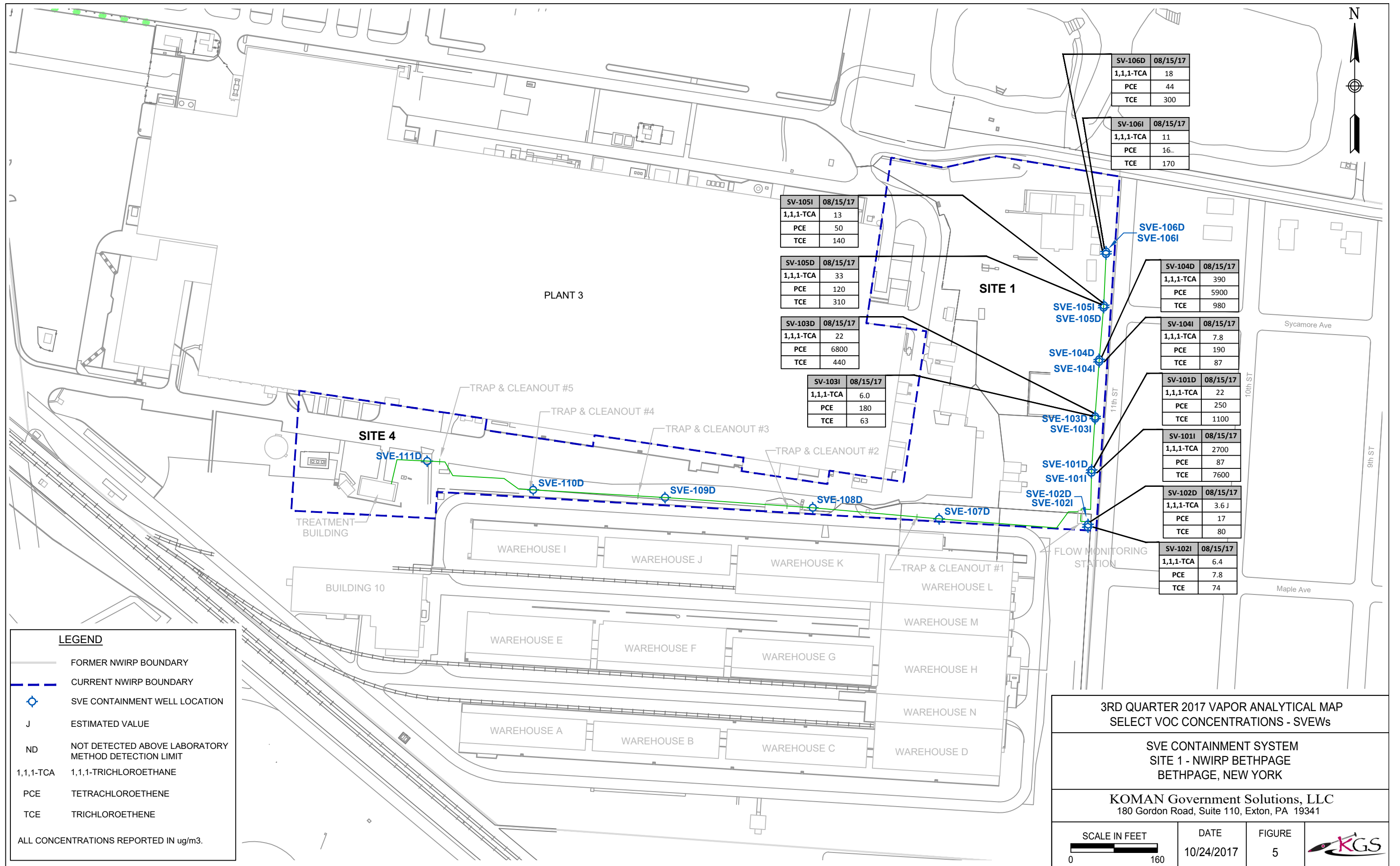




NOTES:
 1. ALL MAN DOORS AND OVERHEAD DOORS ARE EXISTING. MAN DOORS ARE APPROXIMATELY 7'X3'. OVERHEAD DOOR IS APPROXIMATELY 10'X10'.

PROCESS EQUIPMENT LIST		
ITEM NUMBER	NUMBER REQUIRED	NAME/DESCRIPTION
M-1	1	MOISTURE SEPARATOR -CONFIGURATION: VERTICAL, CYLINDRICAL -MATERIAL OF CONSTRUCTION: CARBON STEEL, EPOXY INTERIOR COATING, PAINT EXTERIOR COATING -CAPACITY: 400 GALLON CONDENSATE COLLECTION -DIMENSIONS: 5 FT DIA X 6 FEET HT, 718 GALLON
F-1	1	MAKE-UP AIR FILTER -CONFIGURATION: INTAKE FILTER/SILENCER COMBINATION HOUSING -MATERIAL OF CONSTRUCTION: CARBON STEEL, CORROSION RESISTANCE COATING -CAPACITY: 500 CFM AT 20 IW, 4 INCH FLANGED CONNECTION
F-2	1	BLOWER AIR FILTER -CONFIGURATION: INLINE VACUUM SERVICE FILTER -MATERIAL OF CONSTRUCTION: CARBON STEEL, CORROSION RESISTANCE COATING -CAPACITY: 1,200 CFM AT 35 IW, 10 INCH FLANGED CONNECTION
B-1A, B-1B	2	SOIL VAPOR EXTRACTION BLOWER -CONFIGURATION: HORIZONTAL CENTRIFUGAL -RATING: 600 CFM AT 40 IW -MOTOR: 7.5 HP, 480V, 3PH, 60HZ ODP
VGAC-1	1	VAPOR-PHASE GRANULAR ACTIVATED CARBON -CONFIGURATION: RECTANGULAR TANK -MATERIAL OF CONSTRUCTION: CARBON STEEL, EPOXY INTERIOR COATING, EPOXY EXTERIOR COATING -RATING: 1,600 CFM AT 3 IW, 2,000 CFM AT 6 IW -CAPACITY: 5,000 LBS CARBON -DIMENSIONS: 6' X 8' FOOTPRINT, 6' 8" HT

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND, MID-ATLANTIC NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE, NEW YORK SITE 1, FORMER DRUM MARSHALLING AREA SOIL VAPOR EXTRACTION CONTAINMENT SYSTEM LAYOUT PLAN	NAVFAC ENGINEERING COMMAND MID-ATLANTIC BETHPAGE, NEW YORK SITE 1, FORMER DRUM MARSHALLING AREA SOIL VAPOR EXTRACTION CONTAINMENT SYSTEM LAYOUT PLAN	TETRA TECH ENGINEERING CORPORATION PC SUBMITTED BY: [NAME] CHECKED BY: [NAME] DATE: [DATE]	APPROVED: [NAME] OFFICER IN CHARGE	DATE
REV 0 ISSUED FOR CONSTRUCTION	DESCRIPTION ISSUED FOR CONSTRUCTION	PREP BY DLB	DATE 10-14-09	APPRVD SGP
SEAL AREA				
THIS DRAWING PRODUCED ON AUTOCAD DO NOT REVISE MANUALLY				
THIS DOCUMENT IS THE PROPERTY OF NAVAL FACILITIES ENGINEERING COMMAND, PREPARED BY TETRA TECH ENGINEERING CORPORATION PC, AND IS PROVIDED UPON THE CONDITION THAT IT WILL NOT BE REPRODUCED, COPIED, OR ISSUED TO A THIRD PARTY, AND WILL BE USED SOLELY FOR THE ORIGINAL INTENDED PURPOSE AND SOLELY FOR THE EXECUTION OR REVIEW OF THE ENGINEERING CONSTRUCTION OF THE PROJECT.				
IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW, ARTICLE 145, FOR ANY PERSON, UNLESS UNDER THE DIRECTION OF A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER, TO ALTER AN ITEM ON THIS DOCUMENT IN ANY WAY.				
SAT TO		DATE		
CODE I.D. NO. SCALE - AS SHOWN SPEC. NO.		CONSTR. CONTR. NO. N62473-10-D-3211 NAVFAC DRAWING NO. Figure 4		
SHEET SIZE: D		OF DIS. SH. NO. 1-3		



SV-106D	08/15/17
1,1,1-TCA	18
PCE	44
TCE	300

SV-106I	08/15/17
1,1,1-TCA	11
PCE	16
TCE	170

SV-105I	08/15/17
1,1,1-TCA	13
PCE	50
TCE	140

SV-105D	08/15/17
1,1,1-TCA	33
PCE	120
TCE	310

SV-103D	08/15/17
1,1,1-TCA	22
PCE	6800
TCE	440

SV-103I	08/15/17
1,1,1-TCA	6.0
PCE	180
TCE	63

SV-104D	08/15/17
1,1,1-TCA	390
PCE	5900
TCE	980

SV-104I	08/15/17
1,1,1-TCA	7.8
PCE	190
TCE	87

SV-101D	08/15/17
1,1,1-TCA	22
PCE	250
TCE	1100

SV-101I	08/15/17
1,1,1-TCA	2700
PCE	87
TCE	7600

SV-102D	08/15/17
1,1,1-TCA	3.6 J
PCE	17
TCE	80

SV-102I	08/15/17
1,1,1-TCA	6.4
PCE	7.8
TCE	74

LEGEND

- FORMER NWIRP BOUNDARY
- - - CURRENT NWIRP BOUNDARY
- ⊕ SVE CONTAINMENT WELL LOCATION
- J ESTIMATED VALUE
- ND NOT DETECTED ABOVE LABORATORY METHOD DETECTION LIMIT
- 1,1,1-TCA 1,1,1-TRICHLOROETHANE
- PCE TETRACHLOROETHENE
- TCE TRICHLOROETHENE

ALL CONCENTRATIONS REPORTED IN ug/m3.

**3RD QUARTER 2017 VAPOR ANALYTICAL MAP
SELECT VOC CONCENTRATIONS - SVEws**

**SVE CONTAINMENT SYSTEM
SITE 1 - NWIRP BETHPAGE
BETHPAGE, NEW YORK**

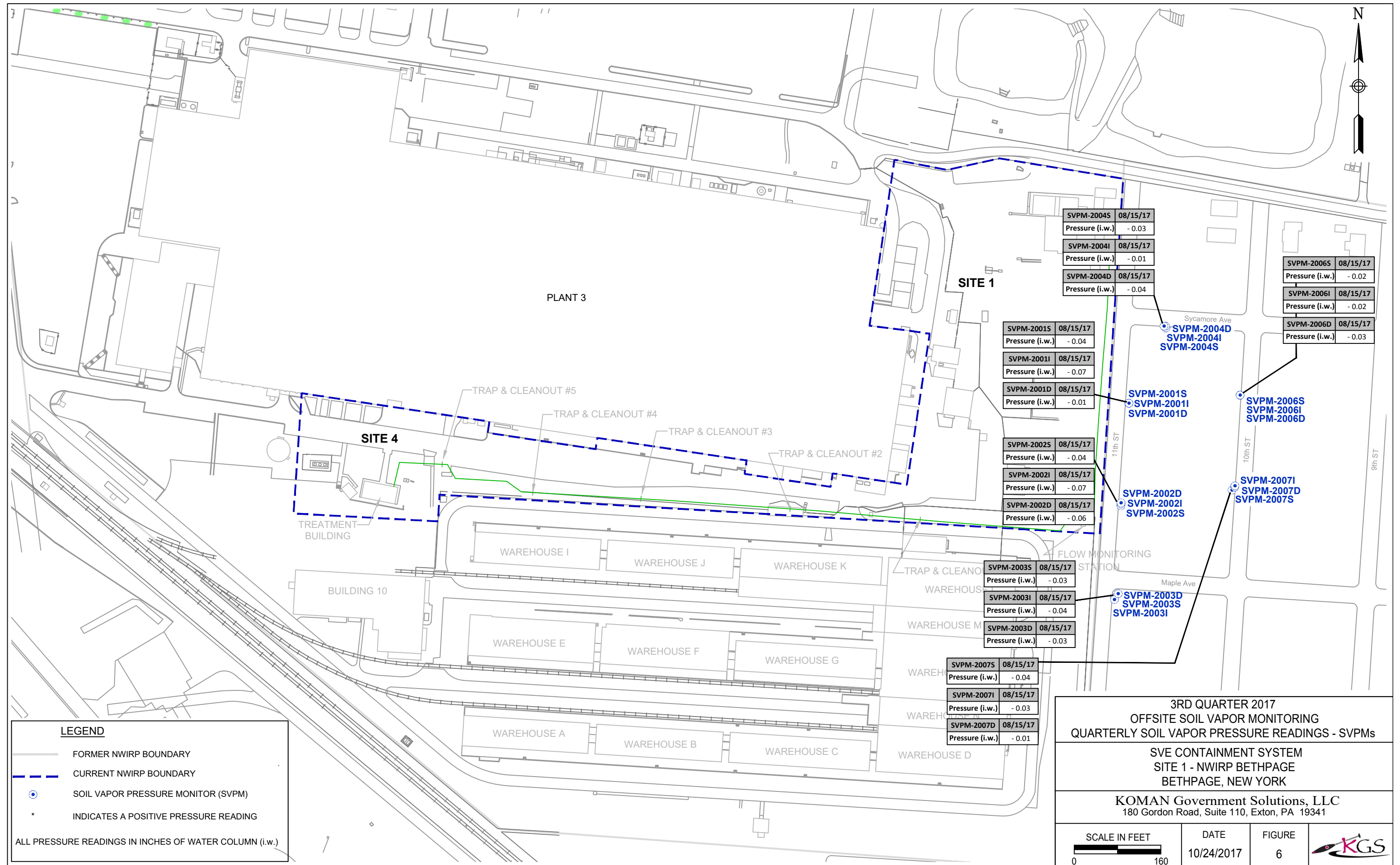
KOMAN Government Solutions, LLC
180 Gordon Road, Suite 110, Exton, PA 19341



DATE
10/24/2017

FIGURE
5





LEGEND

- FORMER NWIRP BOUNDARY
 - - - CURRENT NWIRP BOUNDARY
 - SOIL VAPOR PRESSURE MONITOR (SVPM)
 - * INDICATES A POSITIVE PRESSURE READING
- ALL PRESSURE READINGS IN INCHES OF WATER COLUMN (i.w.)

3RD QUARTER 2017
OFFSITE SOIL VAPOR MONITORING
QUARTERLY SOIL VAPOR PRESSURE READINGS - SVPMs

SVE CONTAINMENT SYSTEM
SITE 1 - NWIRP BETHPAGE
BETHPAGE, NEW YORK

KOMAN Government Solutions, LLC
180 Gordon Road, Suite 110, Exton, PA 19341

SCALE IN FEET 0 160	DATE 10/24/2017	FIGURE 6	
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TABLES

Table 1
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Vapor Monitoring Results
July 2017

Compound	Concentration (ug/m ³)				Emission Rate ^{(1),(2)}				Monthly Mass Recovery ⁽³⁾ (lbs)
	Influent #1	Influent #2	Average	Effluent	Prior to Treatment		Following Treatment		
					(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
1,1,1-Trichloroethane	200	200	200	0	0.0002	1.9504	0.0000	0.0000	0.1656
1,1-Dichloroethane	11	11	11	5.3	0.0000	0.1073	0.0000	0.0517	0.0091
1,1-Dichloroethene	1.6 J	0	0.8	5.6	0.0000	0.0078	0.0000	0.0546	0.0007
1,2-Dichloroethane	0	0	0	0	0.0000	0.0000	0.0000	0.0000	0.0000
cis-1,2-Dichloroethene	210	200	205	87	0.0002	1.9991	0.0001	0.8484	0.1698
Tetrachloroethene	900	890	895	5.3	0.0010	8.7279	0.0000	0.0517	0.7413
trans-1,2-Dichloroethene	3.2	3.1 J	3.15	1.9 J	0.0000	0.0307	0.0000	0.0185	0.0026
Trichloroethene	710	710	710	16	0.0008	6.9238	0.0000	0.1560	0.5880
Vinyl Chloride	0	0	0	0	0.0000	0.0000	0.0000	0.0000	0.0000
Total VOCs	2036	2014	2025	121	0.0023	19.7469	0.0001	1.1809	1.6771

Notes:

All samples were analyzed for site-specific VOCs by modified method TO-15.

Average Monthly Vapor Temp (°F) = 115
Average Monthly Flowrate (cfm) = 324
Average Monthly Flowrate (scfm) = 297
Operational Hours for the month = 744

(1) Emissions (lbs/hr) = Concentration (ug/m³)*(lb/454000000ug)*(0.3048^3m³/ft³)*exhaust flow (scfm)*(60min/hour)

(2) Emissions (lbs/yr) = Emissions (lbs/hour)*(8760hours/yr)

(3) Monthly Mass Removal = AVERAGE FLOWRATE (scfm) * 0.3048^3m³/ft³ * INF AVG CONC (ug/m³) * (lb/454000000ug) * 60 min/hr * OPERATIONAL TIME (hr)

Table 2
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Vapor Monitoring Results
August 2017

Compound	Concentration (ug/m ³)				Emission Rate ^{(1),(2)}				Monthly Mass Recovery ⁽³⁾ (lbs)
	Influent #1	Influent #2	Average	Effluent	Prior to Treatment		Following Treatment		
					(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
1,1,1-Trichloroethane	290	260	275	0	0.0004	3.0690	0.0000	0.0000	0.2607
1,1-Dichloroethane	14	14	14	12	0.0000	0.1562	0.0000	0.1339	0.0133
1,1-Dichloroethene	0	3 J	1	5	0.0000	0.0140	0.0000	0.0547	0.0012
1,2-Dichloroethane	0.93 J	0	0	0	0.0000	0.0052	0.0000	0.0000	0.0004
cis-1,2-Dichloroethene	250	230	240	170	0.0003	2.6784	0.0002	1.8972	0.2275
Tetrachloroethene	1100	990	1045	0	0.0013	11.6622	0.0000	0.0000	0.9905
trans-1,2-Dichloroethene	3.5 J	3.0 J	3	3	0.0000	0.0363	0.0000	0.0346	0.0031
Trichloroethene	1100	1100	1100	0	0.0014	12.2760	0.0000	0.0000	1.0426
Vinyl Chloride	0	0	0	0	0.0000	0.0000	0.0000	0.0000	0.0000
Total VOCs	2758	2600	2679	190	0.0034	29.8973	0.0002	2.1204	2.5392

Notes:

All samples were analyzed for site-specific VOCs by modified method TO-15.

Average Monthly Vapor Temp (°F) = 112
Average Monthly Flowrate (cfm) = 369
Average Monthly Flowrate (scfm) = 340
Operational Hours for the month = 744

(1) Emissions (lbs/hr) = Concentration (ug/m³) * (lb/454000000ug) * (0.3048^3m³/ft³) * exhaust flow (scfm) * (60min/hour)

(2) Emissions (lbs/yr) = Emissions (lbs/hour) * (8760hours/yr)

(3) Monthly Mass Removal = AVERAGE FLOWRATE (scfm) * 0.3048^3m³/ft³ * INF AVG CONC (ug/m³) * (lb/454000000ug) * 60 min/hr * OPERATIONAL TIME (hr)

Table 3
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Vapor Monitoring Results
September 2017

Compound	Concentration (ug/m ³)				Emission Rate ^{(1),(2)}				Monthly Mass Recovery ⁽³⁾ (lbs)
	Influent #1	Influent #2	Average	Effluent	Prior to Treatment		Following Treatment		
					(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
1,1,1-Trichloroethane	270	240	255	0	0.0003	2.4495	0.0000	0.0000	0.2013
1,1-Dichloroethane	14	14	14	13	0.0000	0.1345	0.0000	0.1249	0.0111
1,1-Dichloroethene	0.74 J	0.0	0.37	4	0.0000	0.0036	0.0000	0.0365	0.0003
1,2-Dichloroethane	0.69 J	0.83 J	0.76	0	0.0000	0.0073	0.0000	0.0000	0.0006
cis-1,2-Dichloroethene	220	200	210	150.0	0.0002	2.0172	0.0002	1.4409	0.1658
Tetrachloroethene	1400	1400	1400	0.83 J	0.0015	13.4481	0.0000	0.0080	1.1053
trans-1,2-Dichloroethene	3.2 J	2.6 J	2.9	3 J	0.0000	0.0279	0.0000	0.0279	0.0023
Trichloroethene	1100	990	1045	1.1 J	0.0011	10.0380	0.0000	0.0106	0.8250
Vinyl Chloride	0	0	0	0	0.0000	0.0000	0.0000	0.0000	0.0000
Total VOCs	3009	2847	2928	171.6	0.0032	28.1260	0.0002	1.6486	2.3117

Notes:

All samples were analyzed for site-specific VOCs by modified method TO-15.

Average Monthly Vapor Temp (°F) = 121
Average Monthly Flowrate (cfm) = 323
Average Monthly Flowrate (scfm) = 293
Operational Hours for the month = 720

(1) Emissions (lbs/hr) = Concentration (ug/m³) * (lb/454000000ug) * (0.3048^3m³/ft³) * exhaust flow (scfm) * (60min/hour)

(2) Emissions (lbs/yr) = Emissions (lbs/hour) * (8760hours/yr)

(3) Monthly Mass Removal = AVERAGE FLOWRATE (scfm) * 0.3048^3m³/ft³ * INF AVG CONC (ug/m³) * (lb/454000000ug) * 60 min/hr * OPERATIONAL TIME (hr)

Table 4
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Third Quarter 2017 Vapor Analytical Results Summary of SVE Wells

Sample ID	SVE 101I	SVE 101D	SVE 102I	SVE 102D	SVE 103I	SVE 103D	SVE 104I	SVE 104D	SVE 105I	SVE 105D	SVE 106I	SVE 106D
Sample Date	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)												
1,1,1-Trichloroethane	2700	22	6.4	3.6 J	6.0	22	7.8	390	13	33	11	18
1,1-Dichloroethane	47	3.0 J	ND	ND	1.8 J	ND	1.3 J	60	2.1 J	12	5.4	11
1,1-Dichloroethene	8.0 J	ND	ND	ND	ND	ND	ND	3.0 J	ND	2.7 J	ND	ND
1,2-Dichloroethane	7.0 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	7.0 J	14	ND	2.2 J	5.8	180	31	2200	5.1	20	14	24
Tetrachloroethene	87	250	7.8	17	180	6800	190	5,900	50	120	16	44
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	30	ND	ND	ND	ND
Trichloroethene	7600	1,100	74	80	63	440	87	980	140	310	170	300
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

All samples were analyzed for site-specific VOCs by modified method TO-15.

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

ND = Not detected above method detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 101I															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 (µg/m ³)																
1,1,1-Trichloroethane	51000	3900	2600	450	850	300	1	0.7 J	0.7 J	1500	1500	3200	4400	3400	1900	2200
1,1-Dichloroethane	1200	65	34	14	31	5	0.8 J	0.4 J	0.4 J	28	28	61	76	62	35	36
1,1-Dichloroethene	250	ND	ND	4	8	ND	0.7 J	0.4 J	0.5 J	7.6 J	10	ND	15 J	ND	12 J	8.9 J
1,2-Dichloroethane	NR	30	ND	4	8	ND	0.9	0.5 J	0.5 J	6.9 J	6.4 J	11 J	14 J	12 J	10 J	8.6 J
cis-1,2-Dichloroethene	480	59	ND	9	15	3	0.7 J	ND	0.4 J	7.1 J	7.4 J	20 J	22 J	14 J	6.2 J	11 J
Tetrachloroethene	1700	410	260	36	63	10	1	ND	2	48	46	93	120	80	49	79
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	0.7 J	0.4 J	0.4 J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	180000	18000	14000	1200	2400	560	1	0.6 J	0.6 J	4200	4300	7200	12000	8100	5200	5400
Vinyl Chloride	ND	ND	ND	ND	ND	ND	0.5 J	0.3 J	0.3 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 (µg/m ³)																
1,1,1-Trichloroethane	2900	2600	1200	1600	2500	2000	720	520	2200	2700	3000	ND	ND	1100	1400	2700
1,1-Dichloroethane	57	50	22	29	51	39	15	10	42	45	38	ND	ND	17	22	47
1,1-Dichloroethene	16 J	11 J	7.9 J	6.2 J	21	11 J	ND	ND	ND	ND	6.9 J	ND	ND	4.5 J	6.0 J	8.0 J
1,2-Dichloroethane	9.2 J	7.5 J	4.4 J	9.2 J	12 J	9.8 J	5.2 J	3.8	15	9.0 J	ND	ND	ND	3.1 J	4.2 J	7.0 J
cis-1,2-Dichloroethene	22 J	12 J	4.2 J	8.8 J	24	9.4 J	4.6 J	3.8	9.2 J	6.0 J	ND	ND	ND	ND	4.0 J	7.0 J
Tetrachloroethene	100	80	34	67	83	54	31	31	74	83	82	ND	ND	29	41	87
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	8900	7100	3300	4400	6900	5300	2500	1600	7600	8200	7100	ND	ND	3400	4100	7600
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

µg/m³ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 101D															
Sample Date	12/21/09	03/31/10	06/09/10	09/16/10	12/22/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	26000	130	53	ND	ND	ND	3	8	0.8 J	ND	3.1 J	9.9	11	ND	ND	5.6
1,1-Dichloroethane	660	3.9	ND	ND	ND	ND	2	0.9 J	0.5 J	ND	ND	1.0 J	1.1 J	1.1 J	ND	ND
1,1-Dichloroethene	180	2	ND	ND	ND	ND	ND	0.7 J	0.4 J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	0.5	ND	ND	ND	ND	2	0.5 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	220	8.5	7.5	ND	3	ND	2	2	0.5 J	ND	ND	2.1 J	3.2	ND	ND	ND
Tetrachloroethene	3200	1200	1200	ND	4	ND	26	210	2	ND	79	150	170	130	0.92 J	73
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	2	0.6 J	0.4 J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	100000	1600	310	3	1	ND	3	120	1 J	ND	200	400	350	120	ND	56
Vinyl Chloride	ND	ND	ND	ND	ND	ND	1	0.4 J	0.3 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	16	14	12	20	19	12	ND	22	22	27	22	ND	20	15	5.0	22
1,1-Dichloroethane	1.5 J	1.4 J	1.2 J	0.89 J	1.4 J	ND	ND	2.5 J	2.8 J	2.3 J	1.7 J	ND	3.1	2.2 J	0.85 J	3.0 J
1,1-Dichloroethene	1.0 J	0.75 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.76 J	0.80 J	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	3.0 J	4.5	3.5	1.5 J	4.1	2.3 J	ND	3.3	5.9	5.8	6.4	ND	31	21	3.9	14
Tetrachloroethene	330	340	270	240	260	200	1.0 J	230	250	310	220	ND	300	240	66	250
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	540	680	330	180	410	190	1.7 J	450	1000	2200	990	ND	970	760	260	1100
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 1021															
	12/21/09	03/31/10	06/09/10	09/16/10	12/22/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 (µg/m³)																
1,1,1-Trichloroethane	ND	ND	13	3	ND	NA	2	3	2	ND	0.60 J	3.3 J	ND	ND	ND	1.6 J
1,1-Dichloroethane	ND	ND	ND	ND	ND	NA	0.8 J	0.5 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	NA	0.7 J	0.4 J	0.4 J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	NA	0.8	0.4 J	0.4 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	NA	0.7 J	0.5 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	2.4	1.4	17	6	NR	NA	3	6	6	ND	1.6 J	6.4	1.5 J	2.4 J	1.4 J	3.3 J
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	NA	0.7 J	0.4 J	0.4 J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5.6	3.8	300	88	3	NA	34	76	52	10	26	99	10	10	15	49
Vinyl Chloride	ND	ND	ND	ND	ND	NA	0.5 J	0.4 J	0.3 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	02/05/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 (µg/m³)																
1,1,1-Trichloroethane	ND	ND	0.95 J	10	4.0 J	0.82 J	1.6 J	12	2.8 J	0.87 J	ND	1.3 J	1.2 J	0.54 J	ND	6.4
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	2.6 J	ND	ND	10	4.8 J	1.5 J	2.5 J	13	6.6	2.4 J	ND	2.9 J	3.2 J	1.6 J	1.4 J	7.8
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	21	7.6	8.0	84	39	8.0	22	120	40	12	ND	21	24	8.4	12	74
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

µg/m³ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 102D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	130	53	14	7	2	2	6	4	5	1.4 J	1.2 J	3.9 J	ND	ND	ND	2.3 J
1,1-Dichloroethane	ND	2.7	ND	ND	ND	ND	1	0.6 J	0.7 J	ND	ND	0.51 J	0.95 J	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	1	0.6 J	0.6 J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	0.9	0.5 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	1.4	ND	ND	0.9	ND	1	0.5 J	0.9	ND	ND	1.1 J	4.1	ND	ND	ND
Tetrachloroethene	10	31	31	19	3	9	25	23	39	5.9	6.5	24	25	0.96 J	1.4 J	14
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	1	0.5 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	440	390	190	110	17	21	89	81	87	34	58	170	140	6.5	ND	88
Vinyl Chloride	ND	ND	ND	ND	ND	ND	0.6	0.4 J	0.3 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/24/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	3.1 J	ND	1.6 J	4.5	5.1	2.6 J	ND	5.2	4.9	3.5 J	1.1 J	6.6	3.8 J	2.7 J	1.8 J	3.6 J
1,1-Dichloroethane	0.69 J	ND	0.44 J	ND	ND	ND	ND	ND	1.0 J	0.81 J	ND	0.93 J	0.95 J	0.8 J	0.50 J	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	0.38 J	ND	ND	ND	ND	ND	ND	ND	ND	0.75 J	ND	ND
cis-1,2-Dichloroethene	3.4	ND	2.8 J	0.89 J	3.6	1.6 J	ND	4.2	9.3	8.9	4.4	13	10	5.2	2.6 J	2.2 J
Tetrachloroethene	28	2.6 J	9.6	16	20	11	3.8 J	22	41	42	18	51	37	26	15	17
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	160	3.9 J	39	79	92	36	20	160	180	120	38	150	74	44	48	80
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 103I															
Sample Date	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	900	ND	ND	ND	ND	ND	0.9 J	6	6	ND	1.6 J	9.2	ND	ND	1.4 J	4.7 J
1,1-Dichloroethane	26	ND	ND	ND	ND	ND	0.6 J	2	2	ND	0.75 J	1.5 J	0.77 J	ND	ND	1.5 J
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	0.6 J	0.6 J	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	0.7 J	0.5 J	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	58	ND	ND	1	ND	1	0.5 J	16	12	18	16	19	6.0	2.4 J	5.0	11
Tetrachloroethene	580	ND	ND	ND	ND	2	1 J	420	590	140	200	430	120	40	78	220
trans-1,2-Dichloroethene	580	ND	ND	ND	ND	ND	0.6 J	1	1	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	900	0.9	ND	ND	ND	ND	0.9 J	100	97	29	47	130	48	16	35	95
Vinyl Chloride	ND	ND	ND	ND	ND	ND	0.4 J	0.4 J	0.3 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	2.8 J	0.92 J	ND	4.6	4.9	ND	1.3 J	6.6	3.6 J	1.2 J	0.76 J	6.0	2.2 J	0.73 J	ND	6.0
1,1-Dichloroethane	1.3 J	ND	ND	0.89 J	2.0 J	ND	0.68 J	ND	1.4 J	ND	ND	1.9 J	1.1 J	ND	ND	1.8 J
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	15	6.9	3.4	4.2	6.1	ND	11	9.3	7.3	13	2.7 J	5.2	2.2 J	1.8 J	1.3 J	5.8
Tetrachloroethene	200	97	40	150	130	8.6	130	290	210	450	71	200	99	70	36	180
trans-1,2-Dichloroethene	0.85 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3 J	ND	ND	ND	ND
Trichloroethene	78	46	20	47	50	4.9 J	37	92	74	70	17	67	34	20	9.9	63
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 103D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	3000	1100	230	ND	13	ND	2 J	20	31	7.4 J	6.9 J	22	190	ND	150	170
1,1-Dichloroethane	82	69	ND	ND	2	2	1 J	4	9	1.6 J	1.5 J	1.9 J	10 J	ND	10	10 J
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	1 J	2	6 J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	1 J	1 J	6 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	420	1500	370	ND	92	ND	1 J	360	160	290	230	300	750	ND	550	700
Tetrachloroethene	20000	28000	16000	9	1500	ND	3	1600	6700	3800	3200	4700	4600	1.6 J	3300	4900
trans-1,2-Dichloroethene	ND	24	ND	ND	1	ND	1 J	3	7 J	ND	ND	ND	8.8 J	ND	5.7 J	8.8 J
Trichloroethene	3100	1600	640	7	92	ND	2 J	290	240	180	200	480	440	6.0	360	660
Vinyl Chloride	ND	5.9	ND	ND	2	ND	0.8 J	4	5 J	ND	ND	ND	ND	ND	1.9 J	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	200	550	400	25	38	ND	310	26	30 J	ND	38	ND	16 J	11 J	23 J	22
1,1-Dichloroethane	20 J	50	48	ND	7.8 J	ND	24	ND	ND	ND	ND	ND	6.2 J	ND	4.3 J	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	2600	2100	1800	280	490	ND	930	310	530	ND	310	ND	340	210	250	180
Tetrachloroethene	17000	15000	8600	6600	8900	ND	5800	8900	17000	ND	7500	ND	12000	13000	7500	6800
trans-1,2-Dichloroethene	18 J	32	18	ND	ND	ND	17	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	2100	1400	900	530	680	ND	580	640	1200	ND	300	ND	730	620	320	440
Vinyl Chloride	14 J	ND	2.6 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 104I															
Sample Date	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 (µg/m ³)																
1,1,1-Trichloroethane	730	4.2	ND	4	NR	NA	1 J	4	2	ND	ND	8.3	ND	ND	ND	3.1 J
1,1-Dichloroethane	24	0.54	ND	ND	ND	NA	1 J	0.6 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	NA	1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	NA	1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	110	14	ND	2	0.8	NA	0.9 J	2	3	0.90 J	ND	5.0	ND	2.7 J	ND	3.3
Tetrachloroethene	3100	210	68	96	16	NA	2 J	54	33	12	ND	86	1.6 J	4.8 J	2.3 J	30
trans-1,2-Dichloroethene	15	ND	ND	ND	ND	NA	1 J	0.5 J	0.4 J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	710	44	60	72	12	NA	2 J	44	25	9.6	ND	73	ND	3.1 J	ND	30
Vinyl Chloride	ND	0.47	ND	ND	ND	NA	0.7 J	0.3 J	0.3 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/24/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 (µg/m ³)																
1,1,1-Trichloroethane	2.6 J	ND	9.6	17	15	7.0	1.5 J	8.3	4.0 J	4.6	0.48 J	6.9	6.5	ND	1.2 J	7.8
1,1-Dichloroethane	ND	ND	7.4	8.7	7.7	6.6	ND	ND	ND	2.9 J	ND	ND	3.6	ND	ND	1.3 J
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	5.3	ND	94	160	160	130	7.3	4.2	6.6	54	0.92 J	2.1 J	110	ND	4.1	31
Tetrachloroethene	36	ND	69	210	190	91	13	82	66	79	10	80	530	0.68 J	21	190
trans-1,2-Dichloroethene	ND	ND	ND	1.8 J	2.1 J	1.4 J	ND	ND	ND	ND	ND	ND	1.2 J	ND	ND	ND
Trichloroethene	31	ND	39	110	120	43	17	85	54	35	7.6	83	110	ND	15	87
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

µg/m³ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 104D															
Sample Date	12/21/09	03/31/10	06/09/10	09/16/10	12/22/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	3600	3000	860	ND	270	ND	370	620	440	520	580	620	920	820	0.89 J	500
1,1-Dichloroethane	290	350	140	ND	66	ND	56	110	77	87	95	100	190	160	ND	95
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	3	7 J	7 J	3.0 J	5.0 J	ND	11 J	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	1 J	5 J	5 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	2400	6600	3500	ND	1200	ND	1000	3600	2100	2200	2800 J	2200	4200	3700	8.6	2000
Tetrachloroethene	20000	39000	21000	ND	2400	ND	1400	5800	6300	3800	4300	4600	4500	4200	69	2600
trans-1,2-Dichloroethene	130	70	30	ND	13	ND	14	25	22	26	31	27	55	40	ND	24
Trichloroethene	4600	6000	2400	ND	470	ND	420	1600	1300	1400	1400	1700	2300	2100	14	1200
Vinyl Chloride	ND	12	ND	ND	ND	ND	2	5	5 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	600	340	84	930	880	1.7 J	350	480	790	760	460	460	710	88	260	390
1,1-Dichloroethane	130	56	22	120	130	ND	72	77	120	91	54	73	110	11	31	60
1,1-Dichloroethene	ND	4.3 J	1.0 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6 J	1.2 J	2.9 J	3.0 J
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	3200	1600	460	3300	4400	21	1500	2500	3600	3200	1900	2400	3800	400	1000	2200
Tetrachloroethene	3900	2500	780	8200	8000	120	2200	5100	10000	7700	4500	9400	15000	1400	3000	5900
trans-1,2-Dichloroethene	40	15	3.5	34	53	ND	18	39	49	38	30	38	67	6.5	16	30
Trichloroethene	1600	1100	430	2000	2100	19	1100	1200	2200	1600	750	1400	2200	290	600	980
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 105I															
Sample Date	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	9.9	11	29	ND	24	1	1 J	21	31	11	13	26	22	22	11	24
1,1-Dichloroethane	ND	5.7	13	ND	6	ND	0.6 J	5	7	4.2	5.6	5.6	10	12	8.8	8.0
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	0.6 J	0.6 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	0.7 J	0.6 J	0.5 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	6.6	20	ND	ND	ND	1	10	16	8.1	9.7	13	16	13	14	14
Tetrachloroethene	70	9.1	240	ND	55	5	2	95	100	31	43	100	77	66	38	91
trans-1,2-Dichloroethene	ND	ND	1.6	ND	ND	ND	0.5 J	1	1	ND	ND	1.5 J	ND	ND	ND	ND
Trichloroethene	76	6.3	370	ND	120	7	1	170	200	110	140	260	180	160	94	220
Vinyl Chloride	ND	ND	ND	ND	ND	ND	0.4 J	0.4 J	0.3 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	18	32	26	17	20	20	25	29	30	12	5.0	16	11	5.6	4.8	13
1,1-Dichloroethane	7.4	24	6.8	7.0	8.2	8.6	22	15	28	17	1.5 J	2.8	3.4	2.2 J	2.7 J	2.1 J
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	7.4	17	6.2	9.5	12	7.5	31	28	23	17	1.8 J	7.9	5.0	2.6 J	4.2	5.1
Tetrachloroethene	57	77	48	73	85	51	43	87	66	44	27	64	46	26	17	50
trans-1,2-Dichloroethene	1.0 J	1.6 J	ND	ND	2.8 J	ND	ND	ND	2.3 J	ND	ND	0.83 J	ND	ND	ND	ND
Trichloroethene	140	180	190	140	200	130	160	290	240	84	39	250	160	50	38	140
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
 $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 105D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	12/02/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	550	47	320	1000	590	ND	1 J	490	930	350	320	270	380	430	160	110
1,1-Dichloroethane	300	28	270	250	ND	ND	0.6 J	74	150	69	78	72	110	110	46	45
1,1-Dichloroethene	3.9	ND	ND	2	4	4	0.6 J	6 J	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	4	5 J	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	61	36	85	300	ND	ND	0.7 J	150	380	190	220	150	210	200	73	76
Tetrachloroethene	2100	1.1	650	270	420	ND	2	240	330	140	220	270	350	330	100	140
trans-1,2-Dichloroethene	19	1.1	3.1	3	ND	ND	0.6 J	7 J	3 J	ND	ND	ND	ND	ND	1.4 J	2.4 J
Trichloroethene	1700	68	200	1100	1400	1	2	3000	7000	3600	4500	2200	3800	3800	1400	900
Vinyl Chloride	ND	ND	ND	ND	ND	ND	0.4 J	4 J	ND	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	120	190	ND	92	79	4.3 J	16	35	52	62	68	47	29	23	38	33
1,1-Dichloroethane	70	46	ND	36	28	ND	4.7	12	30	21	15	22	23	19	21	12
1,1-Dichloroethene	1.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7 J
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	85	46	ND	50	36	ND	3.6	16	22	18	26	31	19	19	32	20
Tetrachloroethene	260	300	ND	140	120	2.1 J	18	76	130	140	130	150	110	69	70	120
trans-1,2-Dichloroethene	3.6	1.3 J	ND	1.3 J	1.9 J	ND	ND	ND	ND	ND	ND	1.8 J	2.0 J	1.2 J	1.6 J	ND
Trichloroethene	1200	1900	8.5	650	520	15	75	250	400	410	350	360	210	140	200	310
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 1061															
Sample Date	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	220	8.6	ND	4	ND	NA	6	3	7	1.0 J	2.2 J	11	ND	ND	ND	ND
1,1-Dichloroethane	120	ND	ND	1	ND	NA	1	0.5 J	1	0.62 J	0.70 J	1.6 J	2.5 J	1.9 J	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	NA	0.6 J	2	0.6 J	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	0.8	ND	NA	0.6 J	0.5 J	0.6 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	46	ND	ND	4	ND	NA	6	0.5 J	4	1.6 J	2.3 J	7.5	5.4	3.7	ND	ND
Tetrachloroethene	390	35	ND	15	ND	NA	15	7	19	4.3 J	7.2	27	14	7.0	0.73 J	ND
trans-1,2-Dichloroethene	7.9	ND	3.1	0.9	ND	NA	0.8	0.5 J	0.7 J	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	1900	41	ND	140	10	NA	210	92	190	69	110	260	180	110	5.5	ND
Vinyl Chloride	ND	ND	ND	0.5	ND	NA	0.4 J	0.3 J	0.4 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	18	1.4 J	3.8 J	8.9	2.2 J	ND	8.0	29	30	2.8 J	1.5 J	12	7.5	5.5	2.0 J	11
1,1-Dichloroethane	3.8	ND	17	3.9	1.1 J	ND	18	2.6 J	3.4	1.2 J	ND	ND	1.3 J	2.4 J	0.56 J	5.4
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	1.3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	8.3	ND	23	11	3.1 J	ND	23	6.6	4.9	3.2	0.84 J	3.8	3.1 J	3.2	1.5 J	14
Tetrachloroethene	19	4.2 J	6.2	11	2.9 J	ND	14	39	49	11	5.1 J	20	6.7	4.9	3.9 J	16
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	210	28	70	110	16	0.87 J	130	560	660	200	40	190	71	53	59	170
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 5
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Quarterly Vapor Monitoring Results of SVE Wells
Through Third Quarter 2017

Sample ID	SVE 106D															
	12/21/09	03/31/10	06/09/10	09/16/10	12/08/10	03/30/11	06/28/11	09/06/11	10/14/11	02/10/12	05/11/12	09/11/12	12/05/12	01/15/13	05/16/13	08/27/13
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	340	32	30	20	12	9	20	23	29	ND	11	26	18	ND	ND	27
1,1-Dichloroethane	250	6.3	ND	5	2	5	4	3	3	ND	3.0	4.3	5.8	ND	ND	4.9
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	0.5 J	0.7 J	0.8	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	NR	ND	ND	ND	ND	ND	ND	0.6 J	0.7 J	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	79	13	11	13	2	11	11	5	4	ND	4.1	7.1	8.2	ND	ND	10
Tetrachloroethene	720	65	70	ND	13	19	41	8	66	ND	28	62	48	ND	1.3 J	50
trans-1,2-Dichloroethene	15	ND	ND	ND	ND	ND	0.6 J	0.8	0.9	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	3400	600	900	230	130	170	210	260	320	ND	180	380	300	ND	ND	460
Vinyl Chloride	ND	1.6	ND	ND	ND	ND	ND	0.4 J	0.5 J	ND	ND	ND	ND	ND	ND	ND

Sample Date	11/08/13	01/30/14	04/10/14	07/29/14	10/02/14	01/12/15	05/07/15	08/12/15	10/29/15	01/13/16	04/21/16	09/13/16	11/16/16	01/17/17	04/26/17	08/15/17
Analysis by TO-15 ($\mu\text{g}/\text{m}^3$)																
1,1,1-Trichloroethane	25	5.8	6.3	14	28	ND	26	ND	ND	11	7.2	30	14	10	7.6	18
1,1-Dichloroethane	11	3.7	3.3	5.1	8.9	ND	2.6 J	ND	ND	2.7 J	13	6.8	21	17	2.6 J	11
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	2.5 J	ND	ND	ND	1.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	15	2.8 J	3.9	8.4	15	ND	36	ND	ND	3.2	24	14	22	20	5.6	24
Tetrachloroethene	58	16	17	22	60	ND	110	ND	1.4 J	33	27	57	33	24	17	44
trans-1,2-Dichloroethene	1.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.63 J	1.3 J	2.1 J	ND	ND
Trichloroethene	440	160	84	170	370	0.56 J	71	1.6 J	ND	280	170	450	210	170	190	300
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
 $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
 NR = Not Recorded
 NA = Data not available
 ND = Not detected above method
 detection limit

Table 6
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Third Quarter 2017 Off-site Soil Vapor Monitoring of SVPMs

SVPM/ SVEW Location	Pressure Reading (i.w.)	Valve Position (% open)
Monitoring Date:	8/15/17	8/15/17
BPS1-SVPM2001S	-0.04	--
BPS1-SVPM2001I	-0.07	--
BPS1-SVPM2001D	-0.01	--
BPS1-SVPM2002S	-0.04	--
BPS1-SVPM2002I	-0.07	--
BPS1-SVPM2002D	-0.06	--
BPS1-SVPM2003S	-0.03	--
BPS1-SVPM2003I	-0.04	--
BPS1-SVPM2003D	-0.03	--
BPS1-SVPM2004S	-0.03	--
BPS1-SVPM2004I	-0.01	--
BPS1-SVPM2004D	-0.04	--
BPS1-SVPM2006S	-0.02	--
BPS1-SVPM2006I	-0.02	--
BPS1-SVPM2006D	-0.03	--
BPS1-SVPM2007S	-0.04	--
BPS1-SVPM2007I	-0.03	--
BPS1-SVPM2007D	-0.01	--
SV-101I	-3.0	40
SV-101D	-9.0	50
SV-102I	-3.3	40
SV-102D	-7.0	40
SV-103I	-4.5	40
SV-103D	-8.0	40
SV-104I	-6.5	40
SV-104D	-10.0	40
SV-105I	-7.5	40
SV-105D	-7.0	50
SV-106I	-7.5	40
SV-106D	-11.0	40

Notes:

i.w. = inches of water column
SVEW = soil vapor extraction well
SVPM = soil vapor pressure monitor

Pressure readings for the SVPMs were measured using a portable Magnehelic® Differential Pressure Gauge 2000-0, with a range of 0-0.50 i.w. Pressure readings for SVEWs were recorded from dedicated in-line pressure gauges.

APPENDIX A

**NYSDEC AIR DISCHARGE LIMIT
DOCUMENTATION**

From: Steven Scharf [<mailto:sxscharf@gw.dec.state.ny.us>]
Sent: Thursday, October 06, 2011 11:57 AM
To: Fly, Lora B CIV NAVFAC MIDLANT, IPTNE
Cc: John Swartwout; Walter Parish; Steven Karpinski; John cofman; klumpe@steelequities.com;
David.Brayack@tnus.com
Subject: NWIRP Plant 3 Site 1 SVE Modification Plan

Lora,

The New York State Department of Environmental Conservation (NYSDEC), in conjunction with the New York State Department of Health (NYSDOH), have reviewed the Navy Submittal entitled:

" Modification to existing Soil vapor Extraction (SVE) Containment System At Site 1-Former Drum Marshaling Area, Installation of Soil Vapor Extraction Wells SVE-107D to 111D, NWIRP Bethpage, September 2011."

Based on this Departmental review, and the follow up October 6, 2011 tele-conference, this modification work plan is acceptable and can be used for immediate implementation. The NWIRP Site 1 SVE system has redundant blowers and overcapacity, even with the additional SVE wells being added. should the Navy and the new property owner, Steel Equities Inc., for the former Plant 3 complex come to agreement to add SVE piping from the former Plant 3, this would be acceptable. Appropriate plans, consistent with the covenants and restrictions to the deed, should be submitted accordingly.

A letter will not follow this e-mail. If you have any questions, please contact me directly.

Electronic Documentation Information
NWIRP Bethpage
130003B-OU1-OMM
FOIable
Region 1, Nassau (C), Oyster Bay (T)

Thanks,

Steven M. Scharf, P.E.
Project Engineer
New York State Department of
Environmental Conservation
Division of Environmental Remediation
Remedial Action, Bureau A
625 Broadway
Albany, NY 12233-7015
(518)402-9620
Fax: (518)402-9022

4.0 PROPOSED REVISIONS TO VAPOR DISCHARGE GOALS

To determine the continued need for off gas treatment, the quality of the influent vapor stream was initially estimated based on soil gas results and compared to discharge goals. Vapor phase treatment was initially installed for the system based on projected relatively high concentrations of several chemicals including 1,1,1-trichloroethane (TCA), trichloroethene (TCE), and tetrachloroethene (PCE). Since the December 2009 startup, VOC concentrations in the extracted vapors have decreased by approximately 98.3 percent and it is uncertain as to whether vapor phase treatment is still required. Presented below are the December 2009 and March 2011 influent (untreated) VOC concentrations and loadings and current discharge goals.

Parameter	December 2009 Influent VOCs		March 2011 Influent VOCs ($\mu\text{g}/\text{m}^3$)		Current Discharge Goal (pound/hour) ⁽³⁾
	Concentration ($\mu\text{g}/\text{m}^3$) ¹	Loading (pound/hour) ¹	Concentration ($\mu\text{g}/\text{m}^3$)	Loading (pound/hour) ⁽²⁾	
TCA	13,000	0.074	150	0.00023	0.13
TCE	42,000	0.26	460	0.00069	0.07
PCE	7,900	0.029	440	0.00066	0.0009

⁽¹⁾ Initial VOC Loading Rates are from baseline data taken in December 2009. The flow meter was not yet installed when this data was taken, so a value of 385 CFM (flow rate in January 2010) was used to estimate system loading.

⁽²⁾ Calculated using a flow rate of 400 CFM.

⁽³⁾ Current discharge goals were based on calculated VOC concentrations using soil gas data from the fence line investigation, a flow rate of 600 CFM, and an assumed treatment efficiency for each VOC of 80 to 90 percent. Based on this evaluation, the existing treatment is no longer required to meet discharge goals.

A DAR-1 Model Analysis was then conducted using the August 2010 influent vapor concentrations of TCA, TCE, and PCE at a flow rate of 500 CFM. The calculated results were then used to back calculate proposed discharge goals based on an allowance of 100% of the annual guideline concentrations (see Appendix E). The following table provides a summary of the proposed discharge goals.

Parameter	August 2010 Influent VOCs (370 CFM – Actual)		Percent AGC Using August 2010 Data	Proposed Discharge Goals	
	Concentration ($\mu\text{g}/\text{m}^3$)	Loading (pounds/ hour)		Concentration at 500 CFM ($\mu\text{g}/\text{m}^3$)	Loading (pounds/ hour)
TCA	868	0.0009	0.0004	None ¹	225
TCE	4,170	0.0039	19.4	11,000	0.02
PCE	5,780	0.0057	14.2	22,000	0.04

⁽¹⁾ Greater than 100,000 $\mu\text{g}/\text{m}^3$.

AGC - Annual Guideline Concentration

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Remedial Action A
625 Broadway, 11th Floor
Albany, New York 12233-7015
Phone: (518) 402-9625 • Fax: (518) 402-9022



Website: www.dec.state.ny.us

February 5, 2010

Lora Fly, Project Manager
Naval Facilities Engineering Command-Midlant
9742 Maryland Avenue
Norfolk, VA 23511-3095

RE: Naval Weapons Industrial Research Plant(NWIRP)
Site-Bethpage, NYSDEC No. 1-30-003B.

Dear Ms. Fly:

Tetra Tech FW, on behalf of the Department of the Navy (Navy), has submitted the enclosed New York State Department of Environmental Conservation (NYSDEC) Division of Air Resources (DAR) Air Permit Application as a permit equivalent. This DAR Air permit equivalent is for the soil vapor extraction system at Site 1 of Plant 3 of the former Naval Weapons Industrial Reserve Plant (NWIRP) site in Bethpage, NY. The NYSDEC Division of Environmental Remediation (DER) has reviewed the permit equivalent and, by means of this letter approves the Site 1 remedy air discharge for immediate operation.

The NWIRP Site 1 SVE system utilizes the reasonably available control technology (RACT) with activated carbon. The air discharge will be periodically monitored at start up and will be added for routine monitoring in the operation, maintenance and monitoring (OMM) plan, to be submitted shortly for Departmental review.

If you have any questions, please contact me at your earliest convenience at (518)402-9620.

Sincerely,

A handwritten signature in cursive script, appearing to read "Steve Scharf".

Steven M. Scharf, P.E.
Project Engineer
Division of Environmental Remediation
Bureau of Remedial Action A

Enclosure

cc/w/enc: J. Swartwout/S. Scharf/File
W. Parish, Region 1 NYSDEC
A. J. Shah, Region 1 NYSDEC
S. Patselos, Tetra Tech FW
J. Cofman, Northrop Grumman

E docs: Region 1, Nassau, Oyster Bay (T): NWIRP Bethpage 130003B-OUI-OMM

New York State Department of Environmental Conservation Air Permit Application



DEC ID									
-	-	-	-	-	-	-	-	-	-

APPLICATION ID									
-	-	-	-	-	-	-	-	-	-

OFFICE USE ONLY									
/	/	/	/	/	/	/	/	/	/

Section I - Certification

Title V Certification	
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information [required pursuant to 6 NYCRR 201-6.3(d)] I believe the information is, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.	
Responsible Official	Title
Signature	Date <u> / / </u>

State Facility Certification	
I certify that this facility will be operated in conformance with all provisions of existing regulations.	
Responsible Official	Title
Signature	Date <u> / / </u>

Section II - Identification Information

Title V Facility Permit <u>N/A</u> <input type="checkbox"/> New <input type="checkbox"/> Significant Modification <input type="checkbox"/> Renewal <input type="checkbox"/> Minor Modification	<input type="checkbox"/> Administrative Amendment General Permit Title: _____	State Facility Permit <u>N/A</u> <input type="checkbox"/> New <input type="checkbox"/> Modification General Permit Title: _____
<input checked="" type="checkbox"/> Application involves construction of new facility		<input type="checkbox"/> Application involves construction of new emission unit(s)

Owner/Firm			
Name <u>US Navy / NAVFAC Midlant</u>			
Street Address <u>9742 Maryland Ave, Bldg Z-144</u>			
City <u>Norfolk</u>	State <u>VA</u>	Country <u>US</u>	Zip <u>23511-3095</u>
Owner Classification <input checked="" type="checkbox"/> Federal <input type="checkbox"/> Corporation/Partnership	<input type="checkbox"/> State <input type="checkbox"/> Individual	<input type="checkbox"/> Municipal	Taxpayer ID
Facility			
Name <u>Naval Weapons Industrial Reserve Plant (NWIRP) Site 1</u>			
Location Address <u>Bethpage</u>			
<input type="checkbox"/> City / <input checked="" type="checkbox"/> Town / <input type="checkbox"/> Village <u>Oyster Bay, New York</u>			Zip <u>11714</u>
Project Description			<input type="checkbox"/> Continuation Sheet(s)
<u>Vapor phase granular activated carbon to remove VOCs from soil gas</u>			

Owner/Firm Contact Mailing Address			
Name (Last, First, Middle Initial) <u>Fly, Lora</u>		Phone No. <u>(757) 444-0781</u>	
Affiliation <u>Department of the Navy</u>		Title <u>Remedial PM</u>	
Street Address <u>9742 Maryland Ave, Bldg Z-144</u>		Fax No. ()	
City <u>Norfolk</u>	State <u>VA</u>	Country <u>US</u>	Zip <u>23511-3095</u>
Facility Contact Mailing Address			
Name (Last, First, Middle Initial)		Phone No. ()	
Affiliation		Title	
Street Address		Fax No. ()	
City	State	Country	Zip

**New York State Department of Environmental Conservation
Air Permit Application**



DEC ID									
-	-	-	-	-	-	-	-	-	-

Section III - Facility Information

Classification						
<input type="checkbox"/> Hospital	<input type="checkbox"/> Residential	<input type="checkbox"/> Educational/Institutional	<input type="checkbox"/> Commercial	<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Utility	

Affected States (Title V Only) <i>N/A</i>						Tribal Land: _____
<input type="checkbox"/> Vermont	<input type="checkbox"/> Massachusetts	<input type="checkbox"/> Rhode Island	<input type="checkbox"/> Pennsylvania	<input type="checkbox"/> New Hampshire	<input type="checkbox"/> Connecticut	Tribal Land: _____
		<input type="checkbox"/> New Jersey	<input type="checkbox"/> Ohio			

SIC Codes									
9999									

Facility Description		<input type="checkbox"/> Continuation Sheet(s)
<i>Soil vapor remediation by SVE followed by vapor phase GAC.</i>		

Compliance Statements (Title V Only) <i>N/A</i>	
<p>I certify that as of the date of this application the facility is in compliance with all applicable requirements: <input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at this facility that are operating <u>in compliance</u> with all applicable requirements complete the following:</p> <ul style="list-style-type: none"> <input type="checkbox"/> This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those units referenced in the compliance plan portion of Section IV of this application. <input type="checkbox"/> For all emission units, subject to any applicable requirements that will become effective during the term of the permit, this facility will meet all such requirements on a timely basis. <input type="checkbox"/> Compliance certification reports will be submitted at least once a year. Each report will certify compliance status with respect to each requirement, and the method used to determine the status. 	

Facility Applicable Federal Requirements <i>N/A</i>								<input type="checkbox"/> Continuation Sheet(s)	
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause

Facility State Only Requirements								<input type="checkbox"/> Continuation Sheet(s)	
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause

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Section III - Facility Information

Facility Emissions Summary (continuation)				
CAS No.	Contaminant Name	PTE		Actual (lbs/yr)
		(lbs/yr)	Range Code	
00540-59-0	cis-1,2-Dichloroethene	5		
00107-06-2	1,2-Dichloroethane	0		
00156-60-5	trans-1,2-Dichloroethene	0		
00075-01-4	Vinyl Chloride	0		
-	-			
-	-			
-	-			
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Section IV - Emission Unit Information

Emission Unit Description <input type="checkbox"/> Continuation Sheet(s)										
EMISSION UNIT	1	-	0	0	E	U	1	Effluent from first soil vapor extraction blower (BL-1)		
Vapor Phase Granular Activated Carbon Unit. The emission point is stack COST-2										

Building <input type="checkbox"/> Continuation Sheet(s)					
Building	Building Name		Length (ft)	Width (ft)	Orientation
03-35	Treatment Building		60	40	0

Emission Point <input type="checkbox"/> Continuation Sheet(s)						
EMISSION PT.	03ST2					
Ground Elev. (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section	
	36	6	8	70	Length (in)	Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal
	1,000			03-35	100'	

Emission Point <input type="checkbox"/> Continuation Sheet(s)						
EMISSION PT.						
Ground Elev. (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section	
					Length (in)	Width (in)
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal

Emission Source/Control <input type="checkbox"/> Continuation Sheet(s)							
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
BL1/2	1				048	Granular Act. Carbon	Tetrasolv Filtration
Design Capacity	Design Capacity Units			Waste Feed		Waste Type	
	Code	Description		Code	Description	Code	Description
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model No.
ID	Type				Code	Description	
Design Capacity	Design Capacity Units			Waste Feed		Waste Type	
	Code	Description		Code	Description	Code	Description

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Section IV - Emission Unit Information (continued)

Process Information						<input type="checkbox"/> Continuation Sheet(s)	
EMISSION UNIT 4-00EU1					PROCESS SVE		
Description							
The Soil Vapor Extraction System will consist of 12 SVE wells (6 intermediate and 6 deep), a moisture separator, and 2 soil vapor extraction blowers (BL-1 and BL-2) which both vent to a vapor phase granular activated carbon unit for treatment prior to discharge from stack 00ST2. The VGAC unit will be a 5,000 pound unit filled with Tetrasolv Virgin Carbon. The VGAC unit has been designed to operate nominally at 600 cfm, with a maximum of 1,000 cfm.							
Source Classification Code (SCC)		Total Thruput		Thruput Quantity Units			
		Quantity/Hr	Quantity/Yr	Code	Description		
<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Operating at Maximum Capacity <input type="checkbox"/> Activity with Insignificant Emissions		Operating Schedule		Building	Floor/Location		
		Hrs/Day	Days/Yr				
		24	365	03-35	Main		
Emission Source/Control Identifier(s)							
BL-1	BL-2						
EMISSION UNIT -					PROCESS		
Description							
Source Classification Code (SCC)		Total Thruput		Thruput Quantity Units			
		Quantity/Hr	Quantity/Yr	Code	Description		
<input type="checkbox"/> Confidential <input type="checkbox"/> Operating at Maximum Capacity <input type="checkbox"/> Activity with Insignificant Emissions		Operating Schedule		Building	Floor/Location		
		Hrs/Day	Days/Yr				
Emission Source/Control Identifier(s)							

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Section IV - Emission Unit Information (continued)

Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements										<input type="checkbox"/> Continuation Sheet(s)	
				Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause		
-															
-															
-															
-															

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements										<input type="checkbox"/> Continuation Sheet(s)	
				Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause		
-															
-															
-															
-															

Emission Unit Compliance Certification										<input type="checkbox"/> Continuation Sheet(s)
Rule Citation										
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause	
G	NYCRR	212	-							
<input type="checkbox"/> Applicable Federal Requirement			<input type="checkbox"/> State Only Requirement			<input type="checkbox"/> Capping				
Emission Unit	Emission Point	Process	Emission Source	CAS No.			Contaminant Name			
1-00EU1	00ST3	SVE		00079-01-6			Trichloroethylene			
Monitoring Information										
<input type="checkbox"/> Continuous Emission Monitoring <input checked="" type="checkbox"/> Intermittent Emission Testing <input type="checkbox"/> Ambient Air Monitoring					<input type="checkbox"/> Monitoring of Process or Control Device Parameters as Surrogate <input type="checkbox"/> Work Practice Involving Specific Operations <input type="checkbox"/> Record Keeping/Maintenance Procedures					
Description										
Monthly grab samples analyzed for VOCs from the VGAC unit influent and effluent										
Work Practice		Process Material				Reference Test Method				
Type	Code	Description								
Parameter		Manufacturer Name/Model No.								
Code	Description									
23	Concentration									
Limit		Limit Units								
Upper	Lower	Code	Description							
36,000		255	micrograms per cubic meter							
Averaging Method		Monitoring Frequency		Reporting Requirements						
Code	Description	Code	Description	Code	Description					
01	Instantaneous	05	Monthly	10	Upon Request					

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Section IV - Emission Unit Information (continued)

Determination of Non-Applicability (Title V Only) <i>N/A</i>										<input type="checkbox"/> Continuation Sheet(s)	
Rule Citation											
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause		
Emission Unit		Emission Point		Process	Emission Source		<input type="checkbox"/> Applicable Federal Requirement <input type="checkbox"/> State Only Requirement				
Description											
Rule Citation											
Title	Type	Part	Sub Part	Section	Sub Division	Paragraph	Sub Paragraph	Clause	Sub Clause		
Emission Unit		Emission Point		Process	Emission Source		<input type="checkbox"/> Applicable Federal Requirement <input type="checkbox"/> State Only Requirement				
Description											
Process Emissions Summary										<input checked="" type="checkbox"/> Continuation Sheet(s)	
EMISSION UNIT		1-00EU1					PROCESS		SVE		
CAS No.	Contaminant Name			% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
00071-55-6	1,1,1-Trichloroethane					80	0.34	02			
PTE			Standard Units	PTE How Determined		Actual					
(lbs/hr)	(lbs/yr)	(standard units)				(lbs/hr)	(lbs/yr)				
0.07	591			02							
EMISSION UNIT		1-00EU1					PROCESS		SVE		
CAS No.	Contaminant Name			% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
00127-18-4	Tetrachloroethylene					80	0.00	02			
PTE			Standard Units	PTE How Determined		Actual					
(lbs/hr)	(lbs/yr)	(standard units)				(lbs/hr)	(lbs/yr)				
0.00 8RT	8			02							
EMISSION UNIT		1-00EU1					PROCESS		SVE		
CAS No.	Contaminant Name			% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
00079-01-6	Trichloroethylene					80	0.67	02			
PTE			Standard Units	PTE How Determined		Actual					
(lbs/hr)	(lbs/yr)	(standard units)				(lbs/hr)	(lbs/yr)				
0.13	1,181			02							

New York State Department of Environmental Conservation
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Section IV - Emission Unit Information (continued)

EMISSION UNIT		Emission Unit Emissions Summary				<input checked="" type="checkbox"/> Continuation Sheet(s)
i-00EU1						
CAS No.		Contaminant Name				
00075-34-3		1,1-Dichloroethane				
ERP (lbs/yr)	PTE Emissions			Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT	11				
CAS No.		Contaminant Name				
00075-35-4		1,1-Dichloroethylene (Vinylidene Chloride)				
ERP (lbs/yr)	PTE Emissions			Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT	16				
CAS No.		Contaminant Name				
00540-59-0		cis-1,2-Dichloroethane				
ERP (lbs/yr)	PTE Emissions			Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT	5				
CAS No.		Contaminant Name				
00107-06-2		1,2-Dichloroethane				
ERP (lbs/yr)	PTE Emissions			Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)		
	BRT	BRT				

Compliance Plan N/A												<input type="checkbox"/> Continuation Sheet(s)
For any emission units which are <u>not in compliance</u> at the time of permit application, the applicant shall complete the following												
Consent Order		Certified progress reports are to be submitted every 6 months beginning ___ / ___ / ___										
Emission Unit	Process	Emission Source	Applicable Federal Requirement									
			Title	Type	Part	Sub Part	Section	Sub Division	Parag.	Sub Parag.	Clause	Sub Clause
Remedial Measure / Intermediate Milestones										R/I	Date Scheduled	

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Section IV - Emission Unit Information

EMISSION UNIT		Emission Unit Emissions Summary (continuation)			
1-00E41					
CAS No.		Contaminant Name			
00156-60-5		trans-1,2-Dichloroethene			
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
BRT		BRT			
CAS No.		Contaminant Name			
00075-01-4		Vinyl Chloride			
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
BRT		BRT			
CAS No.		Contaminant Name			
-					
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
CAS No.		Contaminant Name			
-					
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
CAS No.		Contaminant Name			
-					
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
CAS No.		Contaminant Name			
-					
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
CAS No.		Contaminant Name			
-					
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
CAS No.		Contaminant Name			
-					
ERP (lbs/yr)	PTE Emissions		Actual		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	

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Section IV - Emission Unit Information (continued)

Request for Emission Reduction Credits						<input type="checkbox"/> Continuation Sheet(s)			
EMISSION UNIT									
Emission Reduction Description									
Contaminant Emission Reduction Data									
Baseline Period						Reduction			
/ / to / /						Date		Method	
						/ /			
CAS No.			Contaminant Name			ERC (lbs/yr)			
						Netting		Offset	
-									
-									
-									
Facility to Use Future Reduction									
Name						APPLICATION ID			
						- / - / /			
Location Address									
<input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village						State		Zip	

Use of Emission Reduction Credits						<input type="checkbox"/> Continuation Sheet(s)			
EMISSION UNIT									
Proposed Project Description									
Contaminant Emissions Increase Data									
CAS No.			Contaminant Name			PEP (lbs/yr)			
-									
Statement of Compliance									
<input type="checkbox"/> All facilities under the ownership of this "ownership/firm" are operating in compliance with all applicable requirements and state regulations including any compliance certification requirements under Section 114(a)(3) of the Clean Air Act Amendments of 1990, or are meeting the schedule of a consent order.									
Source of Emission Reduction Credit - Facility									
Name						PERMIT ID			
						- / - / /			
Location Address									
<input type="checkbox"/> City / <input type="checkbox"/> Town / <input type="checkbox"/> Village						State		Zip	
Emission Unit		CAS No.		Contaminant Name		ERC (lbs/yr)			
						Netting		Offset	
-		-							
-		-							
-		-							



DEC ID									
-									

Supporting Documentation

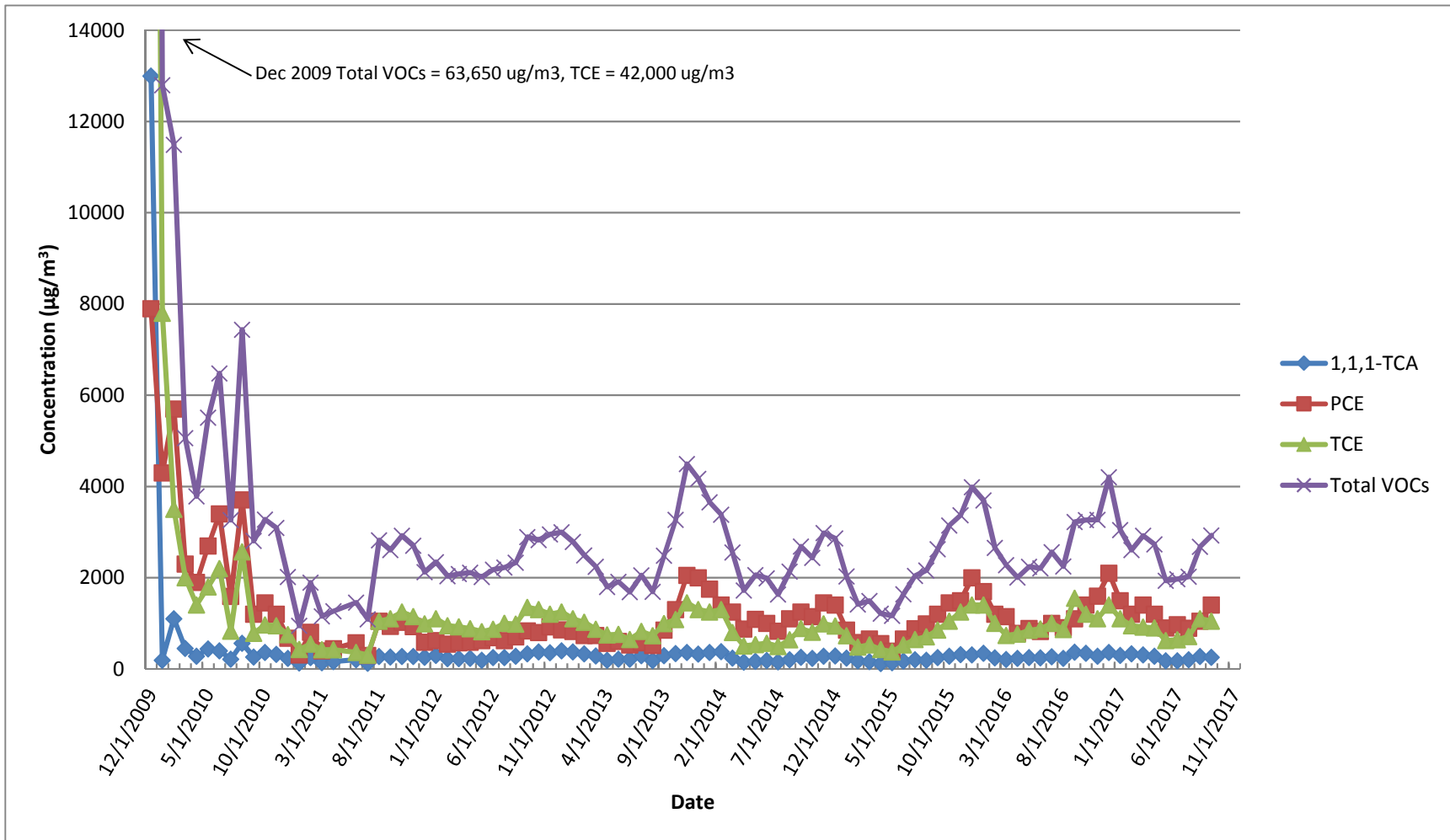
- P.E. Certification (form attached)
- List of Exempt Activities (form attached)
- Plot Plan
- Methods Used to Determine Compliance (form attached)
- Calculations
- Air Quality Model (____ / ____ / ____)
- Confidentiality Justification
- Ambient Air Monitoring Plan (____ / ____ / ____)
- Stack Test Protocols/Reports (____ / ____ / ____)
- Continuous Emissions Monitoring Plans/QA/QC (____ / ____ / ____)
- MACT Demonstration (____ / ____ / ____)
- Operational Flexibility: Description of Alternative Operating Scenarios and Protocols
- Title IV: Application/Registration
- ERC Quantification (form attached)
- Use of ERC(s) (form attached)
- Baseline Period Demonstration
- Analysis of Contemporaneous Emission Increase/Decrease
- LAER Demonstration (____ / ____ / ____)
- BACT Demonstration (____ / ____ / ____)
- Other Document(s): _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)
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- _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)
- _____ (____ / ____ / ____)

APPENDIX B

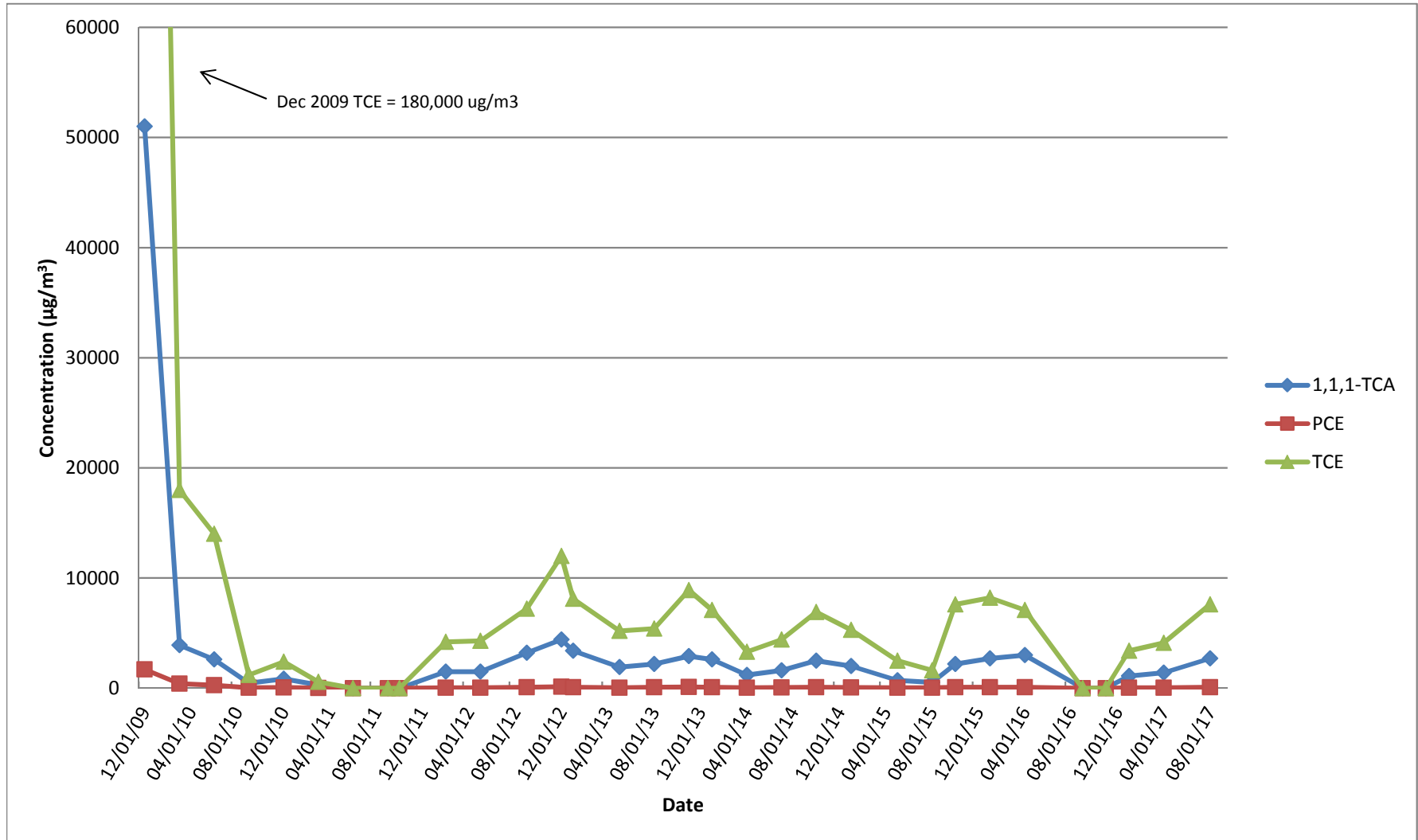
VAPOR CONCENTRATION TREND GRAPHS – SVEWs

Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Vapor Concentration Trends of Select and Total VOCs
SVEWs

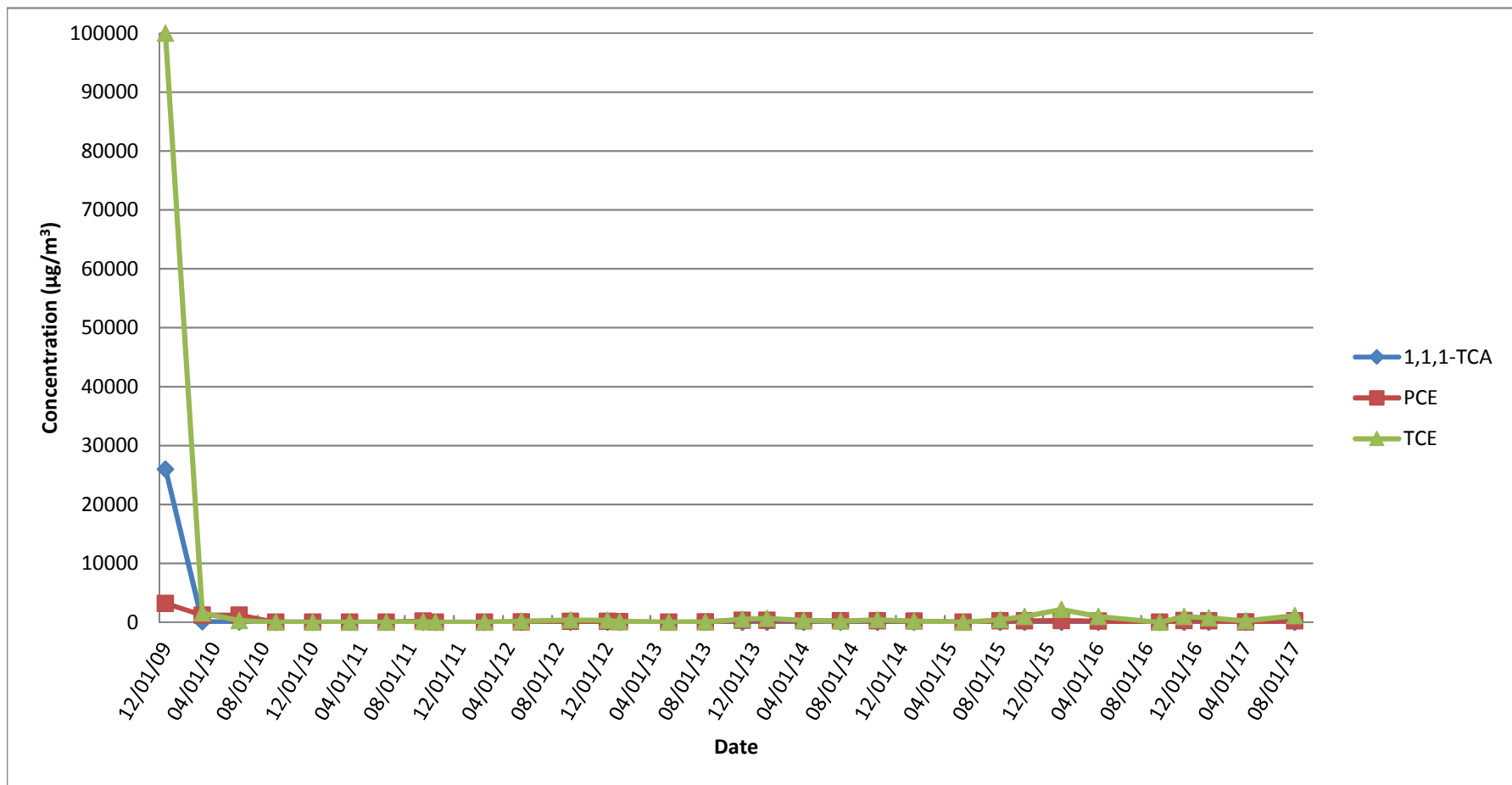
COMBINED INFLUENT



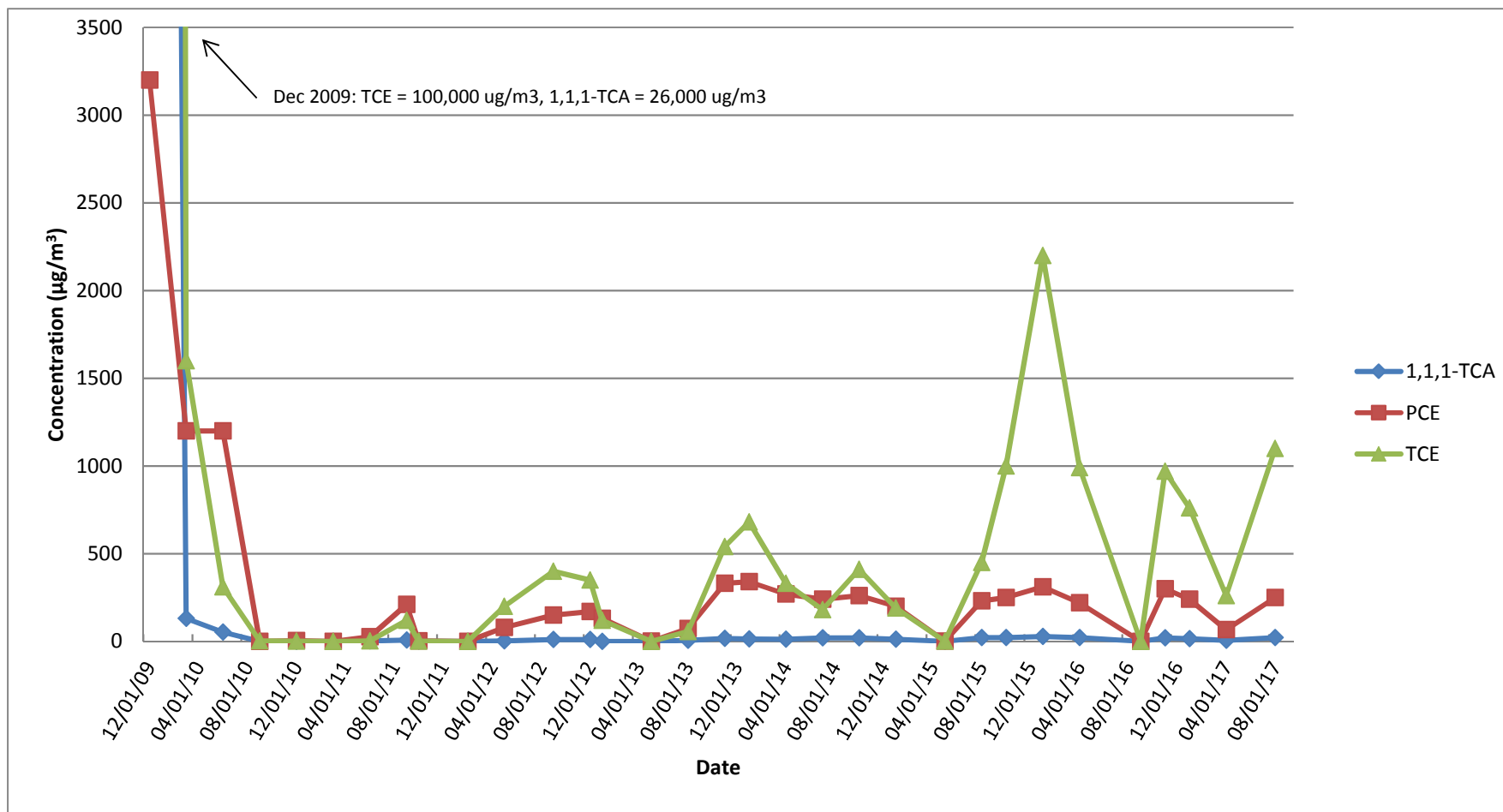
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-101I



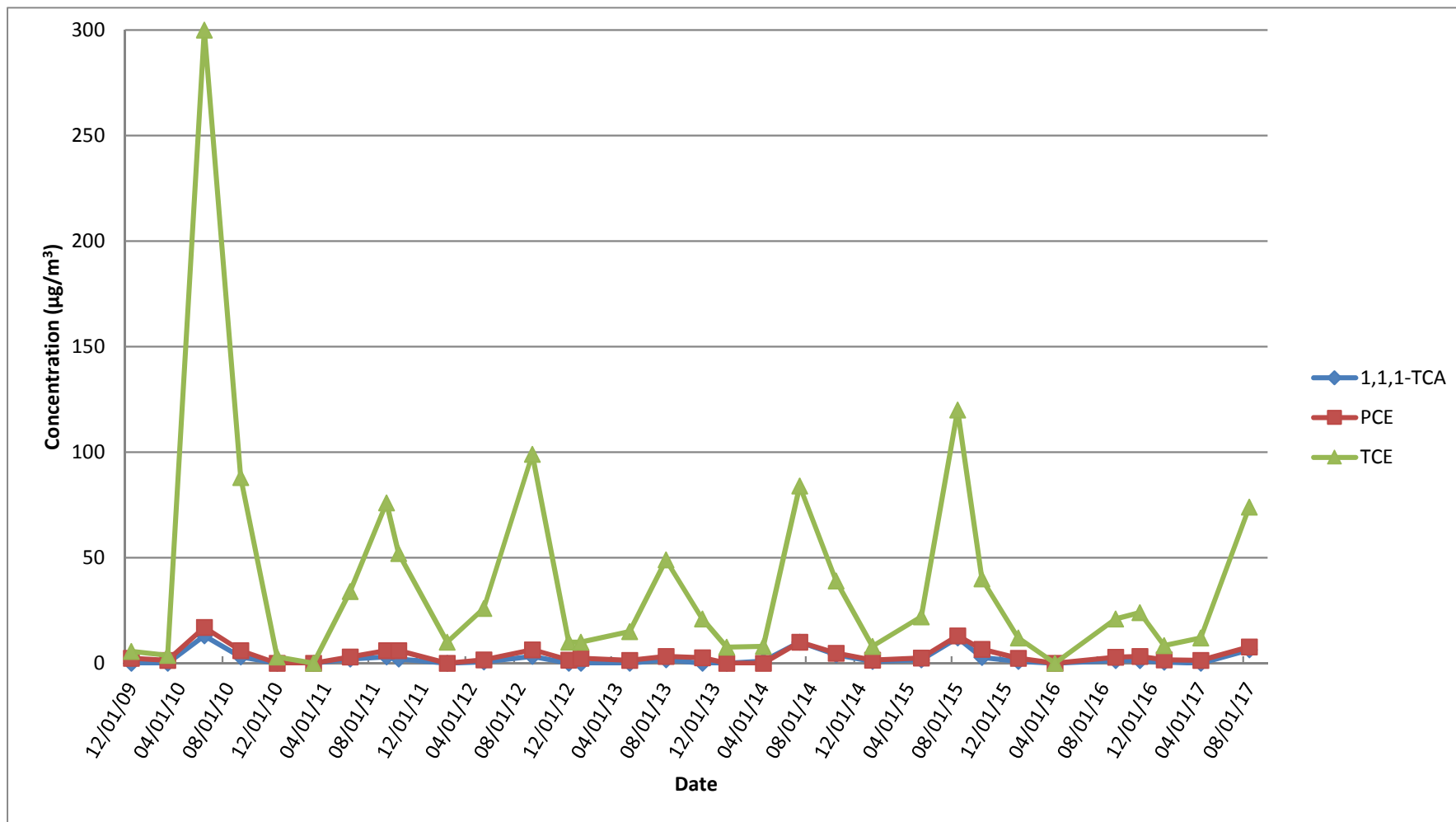
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-101D



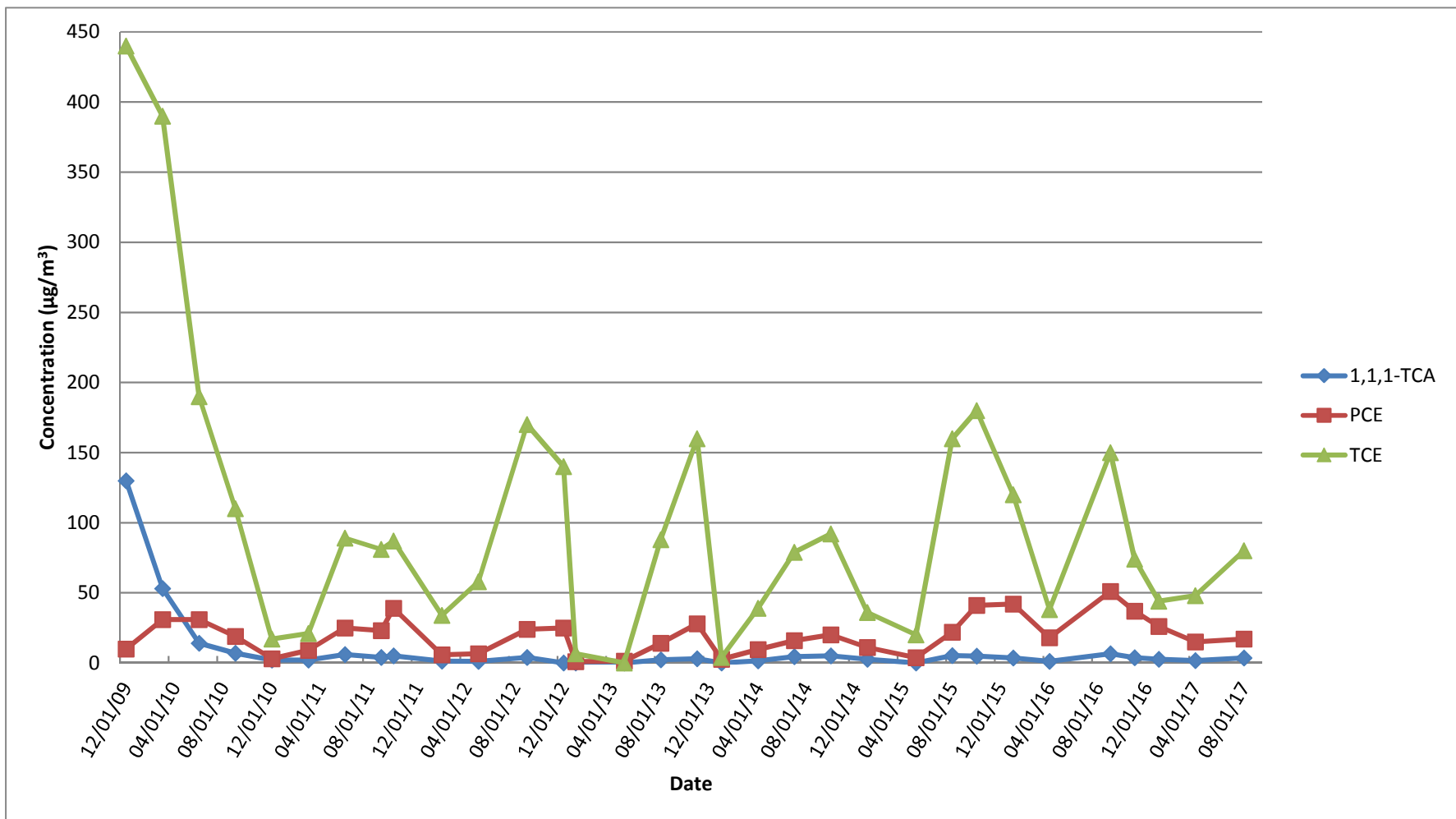
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-101D (smaller scale)



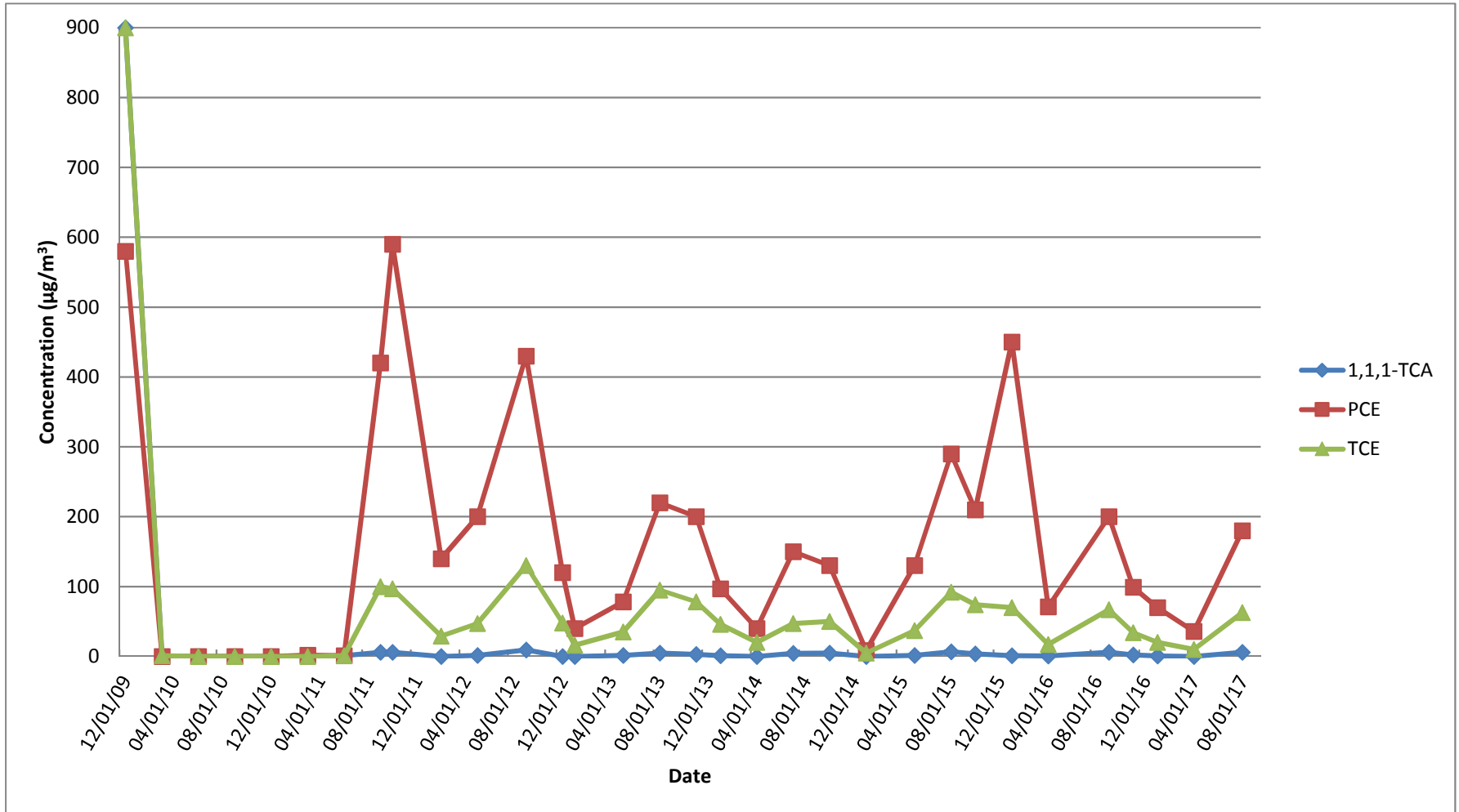
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEs
SV102I



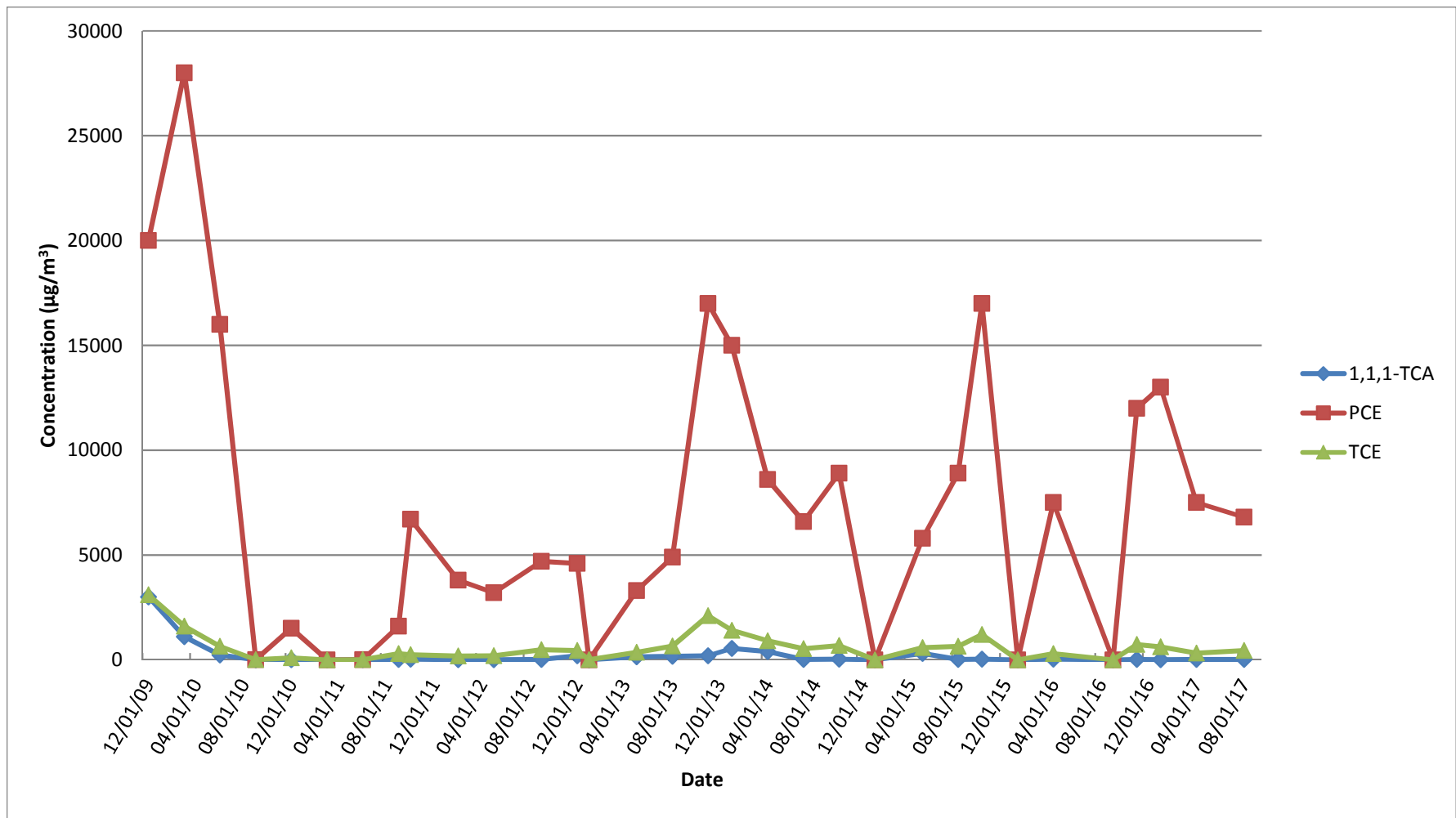
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEs
SV-102D



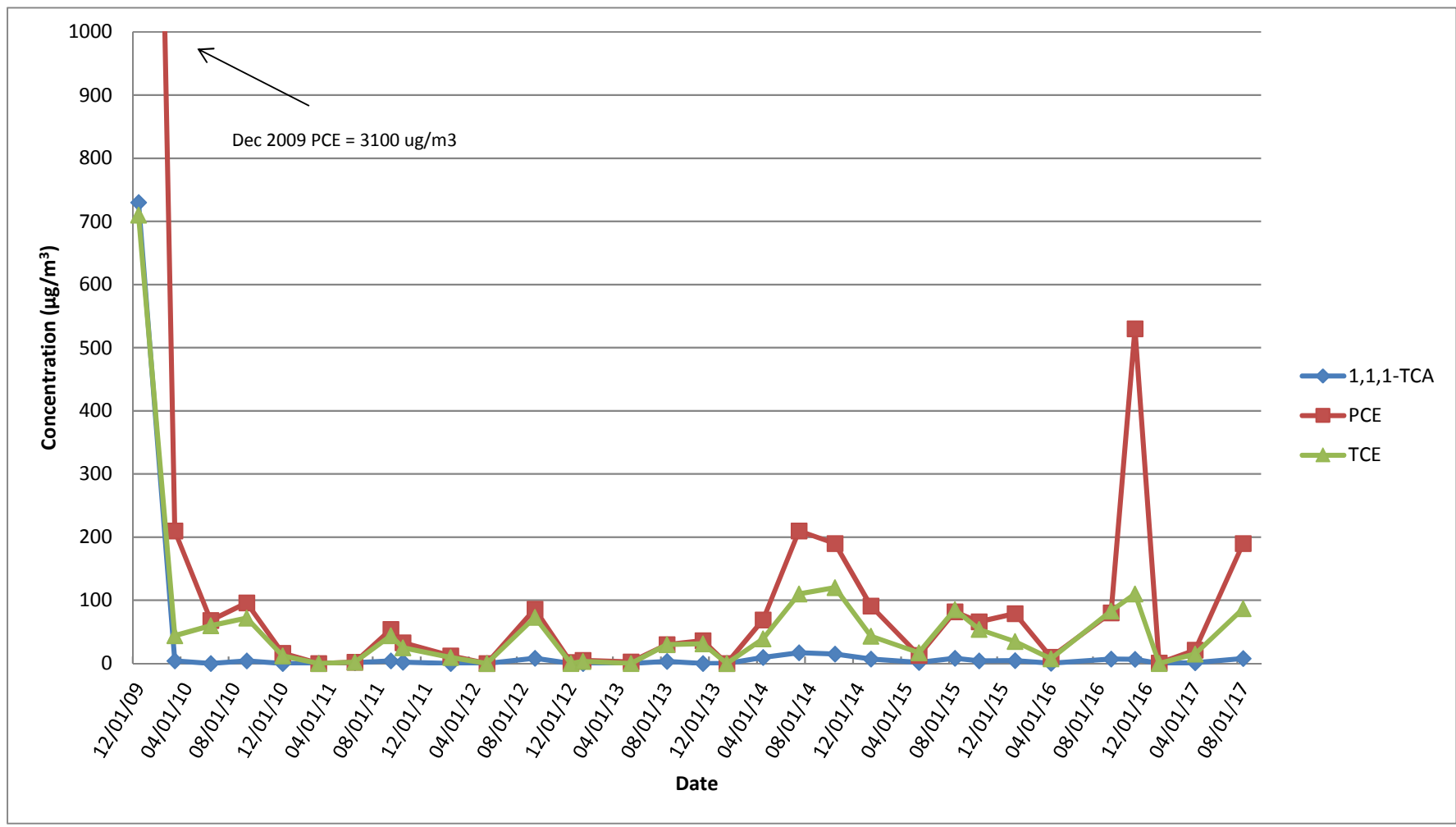
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Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-103I



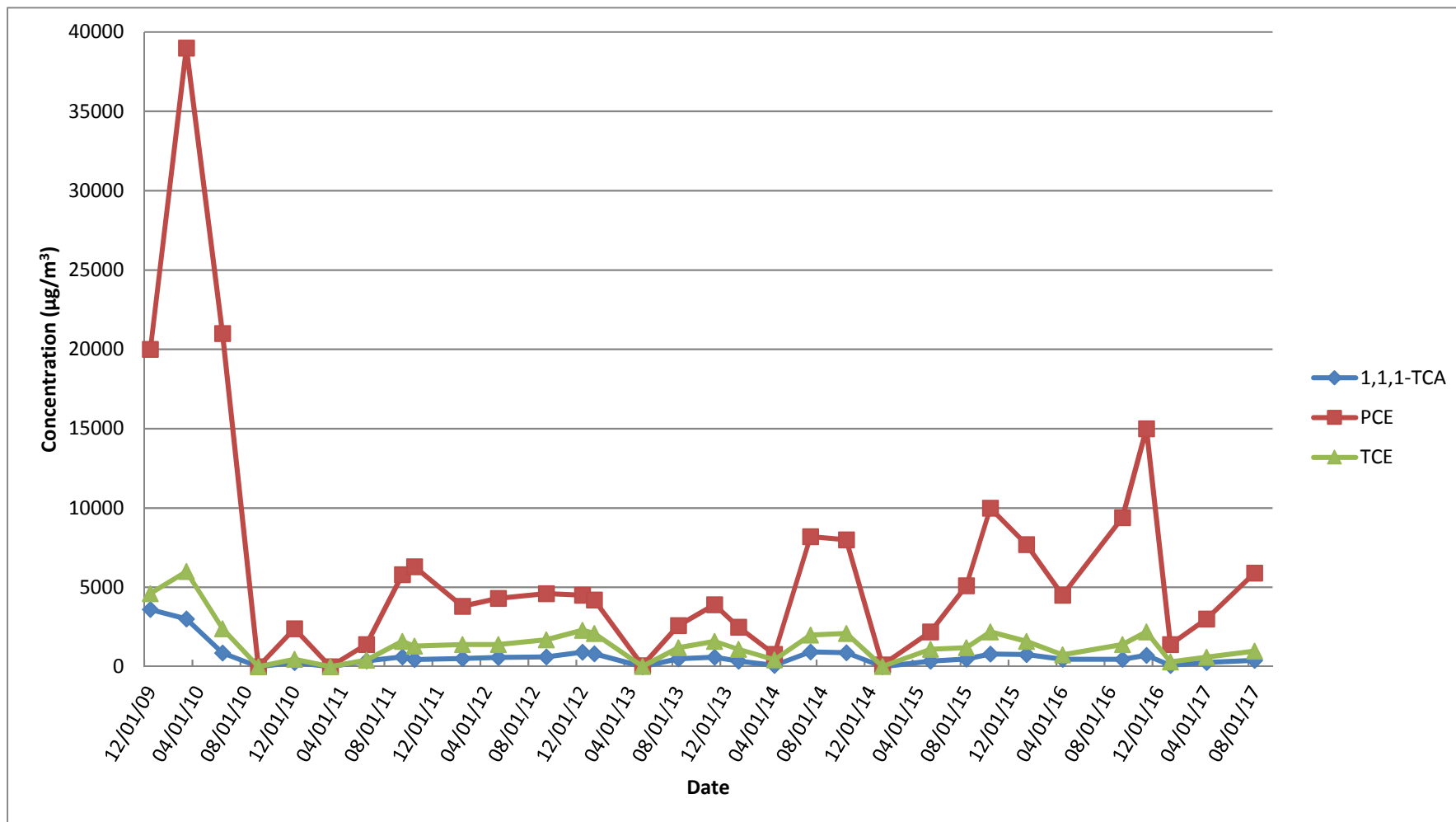
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV103D



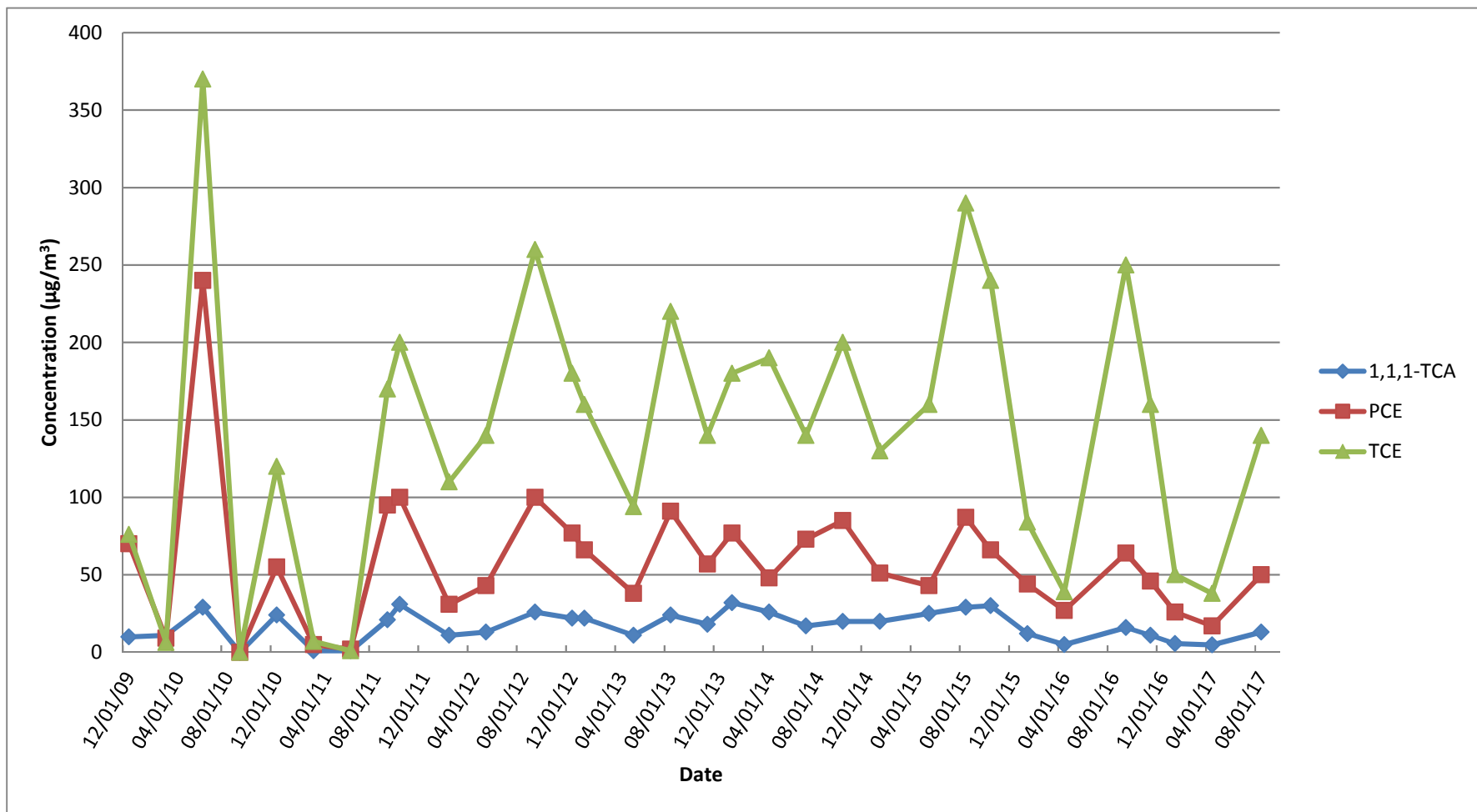
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Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV104I



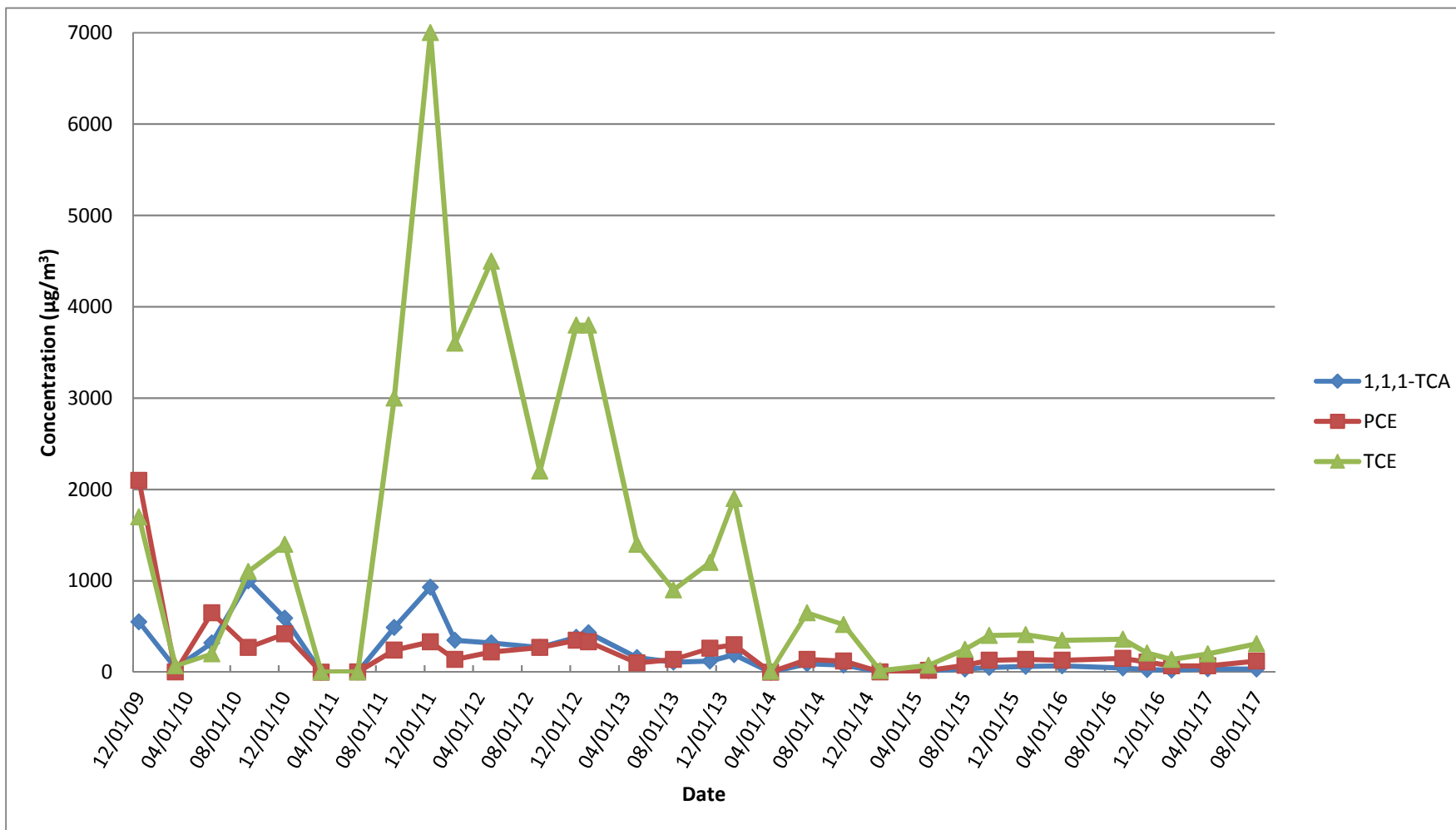
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-104D



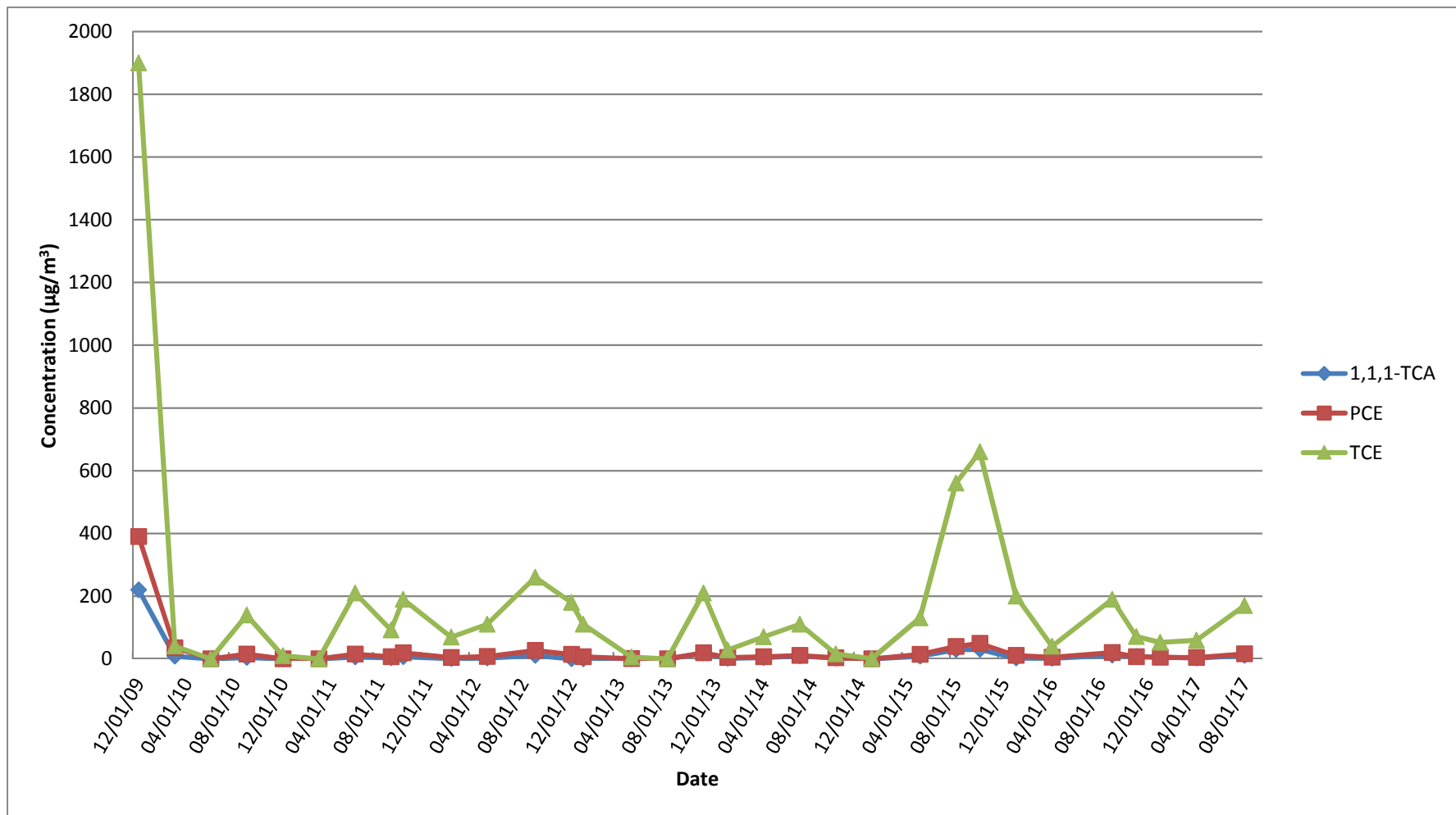
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEs
SV-105I



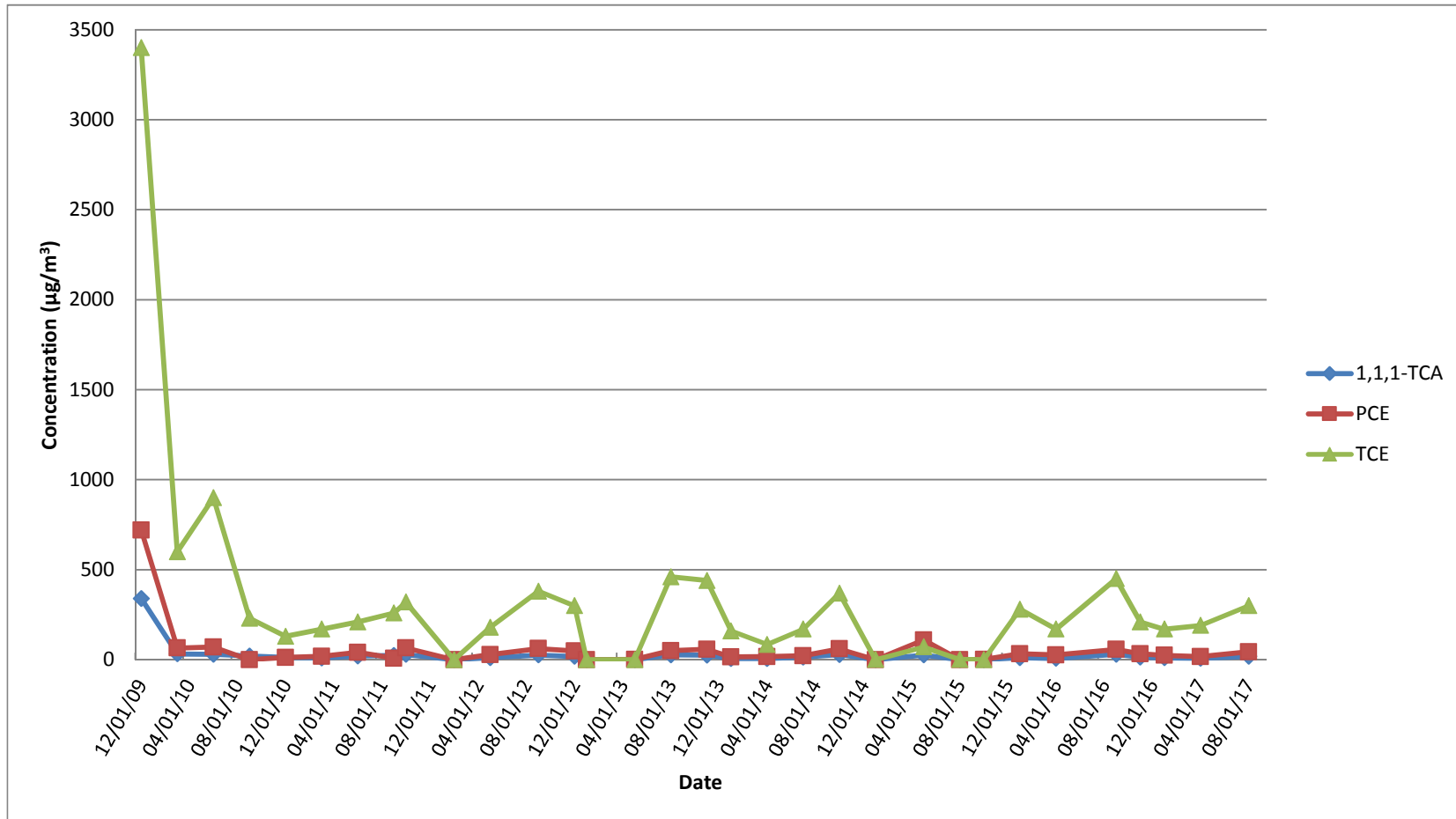
Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-105D



Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-106I



Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEs
SV-106D



Soil Vapor Extraction Containment System
Site 1, Former Drum Marshalling Yard
Naval Weapons Industrial Reserve Plant - Bethpage, NY
Concentration Trends of Select VOCs
SVEWs
SV-106D (smaller scale)

