



April 24, 2017

Mr. Heath Smith  
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**Subject: Integrated Site Assessment Report  
Sporlan Valve Plant #1 Site, Washington, Missouri  
U.S. EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0150  
Task Monitor: Heath Smith, EPA On-Scene Coordinator**

Dear Mr. Smith:

The Tetra Tech, Inc., (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting the enclosed Integrated Site Assessment Report regarding the above-referenced site. A Hazard Ranking System (HRS) scoring memorandum will be submitted separately. If you have any questions or comments, please contact the START Project Manager at (314) 517-6798.

Sincerely,

A handwritten signature in black ink that reads 'D. David Kinroth'.

Dave Kinroth, CHMM  
START Project Manager

A handwritten signature in blue ink that reads 'Ted Faile'.

Ted Faile, PG, CHMM  
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)

**INTEGRATED SITE ASSESSMENT REPORT**

**SPORLAN VALVE PLANT #1 SITE**

**WASHINGTON, MISSOURI**

**Superfund Technical Assessment and Response Team (START)  
Contract No. EP-S7-13-06, Task Order 0150**

Prepared For:

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April 24, 2017

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## CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION .....	1
2.0 SITE DESCRIPTION .....	2
2.1 SITE LOCATION AND DESCRIPTION .....	2
2.2 OPERATIONAL HISTORY AND WASTE CHARACTERISTICS .....	2
2.3 GEOLOGY AND HYDROGEOLOGY .....	3
3.0 PREVIOUS INVESTIGATIONS .....	4
4.0 ISA INVESTIGATION.....	8
4.1 MIP SURVEY .....	8
4.2 SUBSURFACE SOIL SAMPLING.....	10
4.3 GEOPROBE TEMPORARY WELL AND SUMP WATER SAMPLING .....	12
4.4 EXISTING MONITORING WELL SAMPLING .....	14
4.5 MUNICIPAL DRINKING WATER WELL SAMPLING.....	16
4.6 SHALLOW SOIL GAS SAMPLING .....	17
4.7 VI SAMPLING .....	19
5.0 HAZARD RANKING SYSTEM FACTORS .....	20
5.1 SOURCES OF CONTAMINATION.....	20
5.2 GROUNDWATER PATHWAY .....	20
5.2.1 Hydrogeological Setting.....	20
5.2.2 Groundwater Targets.....	20
5.2.3 Groundwater Pathway Conclusions .....	21
5.3 SURFACE WATER PATHWAY .....	22
5.3.1 Hydrological Setting .....	22
5.3.2 Surface Water Targets.....	23
5.3.3 Surface Water Pathway Conclusions.....	23
5.4 SOIL EXPOSURE AND AIR PATHWAYS.....	23
5.4.1 Physical Conditions.....	23
5.4.2 Soil and Air Targets .....	24
5.4.3 Soil Exposure and Air Pathway Conclusions .....	24
6.0 EMERGENCY RESPONSE AND REMOVAL ACTION CONSIDERATIONS .....	25
7.0 SUMMARY .....	27
8.0 REFERENCES .....	30

**CONTENTS (Continued)**

**APPENDICES**

**Appendix**

- A FIGURES
- B PHOTOGRAPHIC LOG
- C FIELD SHEETS AND CHAIN-OF-CUSTODY RECORDS
- D ANALYTICAL SUMMARY TABLES
- E ANALYTICAL RESULTS

**TABLES**

<b><u>Table</u></b>		<b><u>Page</u></b>
1	MIP SURVEY LOCATIONS .....	9
2	SOURCE AREA SUBSURFACE SOIL SAMPLES .....	11
3	TEMPORARY WELL AND SUMP WATER SAMPLES .....	13
4	MONITORING WELL SAMPLES .....	15
5	MUNICIPAL DRINKING WATER WELL SAMPLES .....	16
6	SHALLOW SOIL GAS SAMPLES .....	18
7	ESTIMATED POPULATION SERVED BY GROUNDWATER WITHIN 4 MILES OF THE SITE .....	21

## 1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region 7, under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), tasked Tetra Tech, Inc. (Tetra Tech) to conduct an Integrated Site Assessment (ISA) at the Sporlan Valve Plant #1 site (the site) in Washington, Missouri. The ISA entailed a combined Site Inspection (SI) and Removal Assessment (RA). Tetra Tech performed this investigation under the Superfund Technical Assessment and Response Team (START) 4 Contract Number EP-S7-13-06, Task Order Number 0150.

Purposes of this ISA were to: (1) further delineate extents of trichloroethene (TCE) contamination in soil, groundwater, and soil gas on site and downgradient of the site; (2) assess sub-slab soil gas and indoor air contamination to determine whether harmful concentrations of vapor-phase contaminants present an inhalation threat to occupants of residences and commercial buildings on and near the site; (3) identify areas that warrant further investigation and potential removal activities; and (4) generate reports summarizing ISA findings.

Field work from October to November 2016 accorded with an EPA-approved Quality Assurance Project Plan (QAPP) submitted on September 13, 2016. The Tetra Tech Project Manager (PM) was Dave Kinroth. The EPA On-Scene Coordinator (OSC) and task monitor for the project was Heath Smith.

### **Apparent Problem**

TCE was used for degreasing processes at a former industrial facility at the site. Releases of TCE possibly occurring over several decades resulted in contamination of soil and shallow groundwater beneath the site. Historical soil sampling data indicate TCE contamination at concentrations as high as 2,710 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) in surface samples and 9,390  $\mu\text{g}/\text{kg}$  in subsurface samples collected at the site (EPA 2016a). Existing monitoring well data indicate that the TCE-contaminated groundwater plume is migrating from the release point(s) in shallow groundwater, primarily toward the south and southeast, beneath a number of residences.

A complete exposure pathway exists for vapor intrusion (VI), as TCE has been documented in the groundwater at historical levels as high as 12,100 micrograms per liter ( $\mu\text{g}/\text{L}$ ) (EPA 2016a), and recent results from sampling by EPA and START in fall 2016 indicate TCE levels in residential sub-slab soil gas as high as 4,800 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), and in indoor air samples as high as 6.7  $\mu\text{g}/\text{m}^3$ .

## **2.0 SITE DESCRIPTION**

The site location, description, operational history, waste characteristics, and geology/hydrogeology are discussed below.

### **2.1 SITE LOCATION AND DESCRIPTION**

The site is an unoccupied 4-acre parcel at 611 E. Seventh Street near downtown Washington, Franklin County, Missouri (see Figure 1 in Appendix A). The site includes a groundwater contamination plume that has migrated beyond the property boundaries. The full extent of this plume has not been delineated, but based on groundwater monitoring results, it is known to extend to the south toward Eighth Street and to the east toward MacArthur Street, beneath residential structures. VI sampling by the Missouri Department of Natural Resources (MDNR) in 2015 identified concentrations of TCE that exceeded indoor air screening levels at three residences. Also, sub-slab concentrations of TCE vapors exceeded screening levels at four residences (EPA 2016a).

Approximate geographic coordinates at the center of the site are 38.551900 degrees (°) north latitude and 91.006680° west longitude. The unoccupied parcel is in the northeast quarter of the southeast quarter of Section 22, Township 44 North, Range 1 West, as depicted on the 7.5-minute quadrangle map of Washington West, Franklin County, Missouri (MDNR 2016).

### **2.2 OPERATIONAL HISTORY AND WASTE CHARACTERISTICS**

From 1939 until approximately 2005, the site was the location of the Sporlan Valve Plant #1, where valves for the refrigeration industry were produced. The now-vacant, 4-acre site is owned by SV Land LLC, and is surrounded by a residential neighborhood. Prior to its demolition in 2011, an 80,000-square-foot brick building on a concrete slab stood at the site. The building was constructed in 1939, with continuous expansion through 1968. Operations at the plant included plating, degreasing, machining, brazing, assembling, and testing. Degreasing operations included use of the chlorinated solvent TCE.

Over the course of the facility's manufacturing history, three aboveground storage tanks (AST), ranging in size from 200 to 2,000 gallons, were used to store TCE for the plant's degreasing processes. The 2,000-gallon AST was north of the former manufacturing building and positioned on a concrete pad with no secondary containment. Three underground storage tanks (UST) used to store fuel oil were also present at the site. The fuel oil USTs ranged in size from 2,000 to 10,000 gallons.

An unknown amount of TCE was released from the former valve factory over an unknown period of time. Existing monitoring well data indicate migration of TCE-contaminated shallow groundwater to the south and east, downgradient of the site (EPA 2016a).

The Sporlan Valve Company was acquired by the Parker Hannifin Corporation of Cleveland, Ohio, via merger in October 2004 (*St. Louis Business Journal* [STLBJ] 2004). The plant continued to operate at the 611 E. Seventh Street location until approximately 2005. Exact date of plant closure is unknown (EPA 2016a).

### **2.3 GEOLOGY AND HYDROGEOLOGY**

According to the U.S. Department of Agriculture (USDA) soil survey of Franklin County, Missouri, soils at the site are characterized as Menfro silt loam, consisting of well-drained, silty/silty-clayey loams formed on loess (USDA 2016).

Information regarding the stratigraphy and hydrogeology of the site was provided by the Missouri Geological Survey (MGS) in a 2014 Geohydrologic Summary report. Depth to bedrock varies from a few feet along the northern property boundary to nearly 50 feet south of Eighth Street. Residuum consists of clay, chert, and sand derived from the weathered sedimentary bedrock. A series of Ordovician and Cambrian-age dolomite formations underlie the residuum in the vicinity of the site, and together form the approximately 1,000-foot-thick Ozark Aquifer (MDNR 2016).

In February 2015, depth to groundwater at the site varied between 7.86 and 15.15 feet below ground surface (bgs) (Environ 2015). Therefore, at times, the groundwater surface may be within a few feet of basements at houses along Seventh Street. Slug test data acquired from monitoring wells at the site in 2007 showed a range of hydraulic conductivity between  $1.02 \times 10^{-5}$  and  $3.71 \times 10^{-5}$  centimeters per second (cm/sec). Hydraulic conductivity of the deeper Ozark Aquifer ranges from  $1 \times 10^{-3}$  to  $1 \times 10^{-4}$  cm/sec. All registered wells within 4 miles of the site (301 wells) are reportedly completed in the Ozark Aquifer. The Ozark Aquifer is underlain by the St. Francois confining unit, a series of alternating shale and dolomite formations that form an effective barrier to downward groundwater movement (MDNR 2016).

No site-specific groundwater flow data regarding the Ozark Aquifer are available. Regional estimates of groundwater flow direction based on well data vary from northwest to the northeast. The Missouri River valley is a hydraulic boundary and discharge zone for the Ozark Aquifer near the site. Groundwater flow direction within this aquifer is likely influenced locally by pumping wells and proximity to the Missouri River (MDNR 2016).

### **3.0 PREVIOUS INVESTIGATIONS**

The following sections describe activities and sample results associated with previous investigations at the site, along with relevant data from off-site investigations that detected contamination potentially associated with the site.

#### **Phase I Environmental Site Assessment – 2003**

A Phase I Environmental Site Assessment commissioned by Parker Hannifin Corporation was completed by SECOR International, Inc. (SECOR) on August 15, 2003. The Phase I report identified multiple recognized environmental conditions (REC) to the site. Eight ASTs were identified at the site. Five ASTs were associated with the wastewater treatment area, and ranged from 100- to 3,000-gallon capacities. The other three ASTs held TCE for degreasing processes at the facility, and ranged from 200- to 2,000-gallon capacities. The 2,000-gallon TCE AST was outside near the wastewater treatment area, positioned on a concrete pad with no secondary containment (thus posing a REC). The other two TCE ASTs were within the building. Three fuel oil USTs of unknown age and construction were also present; because the USTs lacked leak detection monitoring systems, SECOR also identified this as a REC. Based on these issues and other conditions, SECOR recommended further investigation of the property (SECOR 2003).

#### **Phase II Limited Soil Investigation – 2004**

SECOR completed a Phase II Limited Soil Investigation commissioned by Parker Hannifin Corporation in 2004. Nine soil borings were advanced from 8 to 20 feet bgs or to bedrock, whichever was encountered first, along the perimeter of the (now demolished) factory building. The investigation identified TCE concentrations as high as 739 µg/kg in soil near the 2,000-gallon TCE AST outside the facility. The Phase II report concluded that soil and groundwater beneath the site appeared to have been impacted by historical site activities (SECOR 2004).

#### **Soil Gas Survey – 2006**

W.L. Gore and Associates, Inc. conducted a subsurface vapor survey (soil gas mass level survey) in 2006. Forty passive vapor sampling devices were installed beneath the factory floor in areas where subsurface contamination was suspected. Results of the survey provided information regarding relative mass of TCE and associated breakdown compounds beneath the floor. Chlorinated compounds were detected in soil gas at high mass levels, with TCE and dichloroethene (DCE) most prevalent. Elevated levels of total petroleum hydrocarbons (TPH) were also detected. Source areas and well-defined soil gas plumes were

observed below the former factory. The report recommended additional soil gas sampling, because the survey had not delineated the full extent of the source areas (EPA 2016a).

### **Phase III Supplemental Investigation – 2012**

In 2012, Ramboll Environ US Corporation (Ramboll Environ) completed a Phase III Supplemental Investigation commissioned by the Sporlan Valve Company. Objectives of the Phase III were to investigate potential source areas via soil sampling along a test trench, and to delineate the approximate extent of TCE impacts on soil within the identified source area(s) via sampling of test pits. Laboratory data indicated presence of the following contaminants: TCE, DCE, methylene chloride, tetrachloroethene (PCE), 1,1,2-trichloroethane (TCA), and vinyl chloride (VC). TCE was detected in all surface soil samples at concentrations ranging from 66.2 to 2,710 µg/kg. TCE was detected in all subsurface samples at concentrations ranging from 36.8 to 9,390 µg/kg (EPA 2016a).

### **Investigations under Oversight of the Missouri Brownfields Voluntary Cleanup Program (BVCP) – 2008 through 2015**

The site was accepted into the Missouri BVCP on January 9, 2008. The BVCP oversaw installation of 12 permanent monitoring wells by the potentially responsible party (PRP)—five on the former Sporlan Valve Company property and seven east and south of the property. Monitoring well depths ranged from 10 to 45 feet bgs. Multiple rounds of groundwater sampling occurred between 2009 and 2015. Maximum TCE concentration detected was 12,100 µg/L in 2009, in a well (MW-3) on the former Sporlan Valve Company property just north of Seventh Street. TCE concentration in the farthest downgradient well (MW-11) increased steadily from 76 µg/L in 2009 to 194 µg/L in 2015.

The BVCP also oversaw installation of sub-slab soil gas monitoring ports at four residences along Seventh Street. By 2015, eight rounds of sub-slab sampling had occurred at each of the four residences. In October 2012, TCE was detected in sub-slab vapors at 760 µg/m<sup>3</sup> below one of the homes. No indoor air sampling occurred during these rounds of VI sampling.

In 2011, the valve manufacturing building and foundation slab were demolished, and the site was cleared of most demolition debris.

In 2012, the three heating oil USTs were removed from the site. A release of heating oil was discovered beneath a 10,000-gallon UST, requiring removal and off-site disposal of 67 tons of petroleum-contaminated soil.

In April 2015, the PRP withdrew the site from participation in the BVCP (EPA 2016a).

### **MDNR Site Inspection/Removal Site Evaluation – 2015**

In July 2015, MDNR conducted a combined SI and Removal Site Evaluation (RSE) that included VI sampling. MDNR collected samples of indoor air, crawlspace air or sub-slab soil gas, and sump water at 12 residences downgradient of the site. Analytical data from this sampling, along with previous sub-slab results acquired during enrollment of the site in the BVCP, indicated levels of TCE exceeding health-based screening levels in indoor air and/or sub-slab vapors overlying the TCE-contaminated shallow groundwater. Concentrations of TCE were found to exceed indoor air screening levels at three residential properties. A maximum of 3.9  $\mu\text{g}/\text{m}^3$  was detected in indoor air at a residence along Seventh Street. Concentrations of TCE were found to exceed sub-slab vapor screening levels at four residential properties. A maximum concentration of 820  $\mu\text{g}/\text{m}^3$  was detected in sub-slab soil gas at a property north of Eighth Street (MDNR 2016).

Following MDNR's receipt of VI sampling results, documenting presence of TCE at levels exceeding MDNR's and EPA's health-based screening levels, the site was referred by MDNR to EPA for removal action consideration on August 20, 2015 (EPA 2016a).

### **EPA Vapor Intrusion Sampling Analysis – 2015**

Based on the information provided to EPA from the 2015 MDNR SI/RSE, EPA determined that a complete subsurface VI to indoor air exposure pathway existed at one property. The report acknowledged that periodic monitoring had not occurred at properties assessed for VI; therefore, quarterly VI monitoring was recommended at targeted residential properties, along with groundwater sampling to enable completion of plume delineation (horizontal and vertical extents).

MDNR's 2015 SI/RSE, along with EPA's review of other available data, resulted in installation of sub-slab depressurization vapor mitigation systems (VMS) at two residences (Property Identifications [ID] 153 and 176). Those systems were installed by contractors hired by Ramboll Environ on behalf of the PRP. The full extent of groundwater contamination in this residential area, and possible inhalation exposures resulting from VI from the contaminated shallow groundwater, remained unknown (EPA 2016a).

## **Enforcement Actions – 2016**

CERCLA and the National Contingency Plan (NCP) both contain provisions that support and encourage early actions to mitigate actual and potential threats to human health associated with VI. According to EPA Office of Solid Waste and Emergency Response (OSWER) Publication 9200.2-154 – Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA 2015), for sites not on the National Priorities List (NPL), EPA may use its removal authority under CERCLA to undertake early action to mitigate VI threats. Under this authority, EPA issued a Unilateral Administrative Order for Removal Action (UAO, or Order) to SV Land LLC, requiring removal action to abate imminent and substantial endangerment to the public health or welfare or the environment that may be presented by actual or threatened release of hazardous substances at or from the site. Under this Order, SV Land, LLC was required to either conduct quarterly sampling at residences to determine if a complete exposure pathway existed for TCE vapors or had the option to preemptively mitigation residences in lieu of sampling. SV Land LLC retained the services of an environmental consulting contractor, Ramboll Environ, to oversee installation of VMSs in selected homes within a designated inclusion zone around the site perimeter, for preemptive mitigation of potential for VI into those structures. Initially, this activity was planned to focus on the 11 properties nearest the south site perimeter along East Seventh Street due to their proximity to the known groundwater plume (Property IDs 145 to 155, as indicated on Figure 2 in Appendix A). Performance sampling of indoor air at these properties 30 days after the VMSs had been installed was also required. These activities began in fall 2016.

In conjunction with the enforcement action and as an element of the current ISA activities, EPA tasked Tetra Tech START to conduct VI assessment sampling at additional residences around the site perimeter beyond the PRP's initial property inclusion zone. These activities began in August 2016 and are ongoing, with sampling events conducted quarterly. Documentation of these activities and corresponding sample results is occurring in separate VI assessment reports. The remainder of this report discusses recent investigative efforts and summarizes analytical results from soil, groundwater, and soil gas samples collected during the ISA.

## 4.0 ISA INVESTIGATION

Section 4.0 discusses the ISA field sampling and associated quality assurance (QA)/quality control (QC) activities. General objectives of the ISA were to further evaluate potential source areas, better delineate extents of soil and groundwater contamination, and assess VI threats.

START Members (SM) Dave Kinroth, Quan Do (Geoprobe® operator), Laura Moore, Greg Blattner, Ann Marie Pohlman, and Megan Sawyer conducted field activities from October 25 through December 7, 2016. A Membrane Interface Probe (MIP) survey occurred during October 25-27, 2016. Subsurface soil sampling was conducted on October 31 and November 1, 2016. Sampling of Geoprobe® temporary wells and sump water occurred during November 2-7, 2016. Existing monitoring well sampling was performed on November 16 and 17, 2016. Shallow soil gas sampling occurred on November 21 and 29, 2016. Municipal drinking water well sampling was conducted on December 7, 2016. VI sampling began on August 3, 2016, and continues via quarterly sampling events. Photographs documenting site activities are in Appendix B.

Activities proceeded as specified in a site-specific QAPP for the ISA developed by START and submitted to EPA in September 2016 (Tetra Tech 2016). Samples collected under Analytical Services Request (ASR) 7257 were delivered by FedEx to the EPA Region 7 laboratory in Kansas City, Kansas, between November 2 and December 8, 2016. Standard turnaround times were requested for all samples. Field sheets and chain-of-custody records for the samples are in Appendix C. Summary tables of analytical results are in Appendix D. The complete laboratory data package for ASR 7257 is in Appendix E.

### 4.1 MIP SURVEY

On October 25-27, 2016, SMs Kinroth and Moore, EPA OSC Smith, and EPA Region 7 Environmental Sciences and Technology Division employees Lorenzo Sena, Laura Webb, and James Regehr used the MIP at survey locations 1 through 37 at the site (see Figure 3 in Appendix A). The MIP served as a screening tool in an attempt to better delineate the extent of TCE contamination in subsurface soils. MIP detector responses are measured in microvolts ( $\mu\text{V}$ ). In practice, greater concentrations of halogenated volatile organic compounds (VOC) in the media being measured are represented by higher responses of the MIP's halogen-specific detector (XSD) and photoionization detector (PID). Variations in response may also be caused by fluctuating temperatures in the detector core, condition of the membrane, and changes in flow rate of the carrier gas.

The EPA Geoprobe® was used to advance the MIP into subsurface soils to obtain continuous logs of chlorinated VOCs in soils at the survey locations. The logs provided by the MIP assessment were used to assist with selection of locations and depths for subsurface soil sampling for laboratory analysis for TCE and related chlorinated VOCs, as well as benzene, toluene, ethylbenzene, and total xylenes (BTEX).

Table 1 summarizes MIP survey locations during the ISA.

**TABLE 1**  
**MIP SURVEY LOCATIONS**  
**SPORLAN VALVE PLANT #1 SITE**  
**WASHINGTON, MISSOURI**

Survey Location	Survey Date	Survey Time	MIP Refusal Depth (ft bgs)
MIP-1	10/25/16	1208	31.5
MIP-2	10/25/16	1309	24
MIP-3	10/25/16	1355	22.5
MIP-4	10/25/16	1437	22
MIP-5	10/25/16	1521	17.5
MIP-6	10/25/16	1600	19.5
MIP-7	10/25/16	1635	20
MIP-8	10/25/16	1710	21
MIP-9	10/25/16	1745	20.5
MIP-10	10/26/16	0940	23
MIP-11	10/26/16	1034	22.5
MIP-12	10/26/16	1118	27
MIP-13	10/27/16	0954	17.5
MIP-14	10/27/16	0859	19
MIP-15	10/27/16	0828	17
MIP-16	10/27/16	0803	12
MIP-17	10/27/16	0738	10.5
MIP-18	10/26/16	1809	12
MIP-19	10/26/16	1654	14
MIP-20	10/26/16	1621	17
MIP-21	10/26/16	1545	19
MIP-22	10/26/16	1511	17.5
MIP-23	10/26/16	1429	19.5
MIP-24	10/26/16	1210	21.5
MIP-25	10/27/16	1028	11
MIP-26	10/27/16	1052	11
MIP-27	10/27/16	1116	7
MIP-28	10/27/16	1135	5
MIP-29	10/27/16	1152	5
MIP-30	10/27/16	1301	9
MIP-31	10/27/16	1323	19
MIP-32	10/27/16	1357	18.5
MIP-33	10/27/16	1430	20.5
MIP-34	10/27/16	1507	20
MIP-35	10/27/16	1538	21.5

**TABLE 1 (Continued)**

**MIP SURVEY LOCATIONS  
SPORLAN VALVE PLANT #1 SITE  
WASHINGTON, MISSOURI**

<b>Survey Location</b>	<b>Survey Date</b>	<b>Survey Time</b>	<b>MIP Refusal Depth (ft bgs)</b>
MIP-36	10/27/16	1614	19
MIP-37	10/27/16	1646	18.5

Notes:

ft bgs      Feet below ground surface  
MIP         Membrane Interface Probe

**MIP Results**

XSD responses ranged from 207,256 to 1,354,259  $\mu\text{V}$ , and PID responses ranged from 190,283 to 8,811,914  $\mu\text{V}$ . Higher XSD responses occurred at MIP survey locations 23 (899,533  $\mu\text{V}$  at 16-16.5 feet bgs) and 30 (1,354,259  $\mu\text{V}$  at 7-8 feet bgs), at or near suspected source areas. Highest PID results were also observed at those locations. Figures 4-9 in Appendix A depict MIP detections in subsurface soil in multiple 3D cross-section views.

**4.2 SUBSURFACE SOIL SAMPLING**

Following the MIP assessment, START returned to selected MIP survey locations for collection of soil samples for laboratory analysis. On October 31 and November 1, 2016, SMs Kinroth, Blattner, Do, and Pohlman collected subsurface soil samples at 18 MIP survey locations by use of Geoprobe® Macro-Core® soil samplers at discrete depth intervals corresponding to a range of MIP readings. In addition, one subsurface soil sample (background) was collected upgradient of the site near Municipal Well #5. See Figure 3 in Appendix A for subsurface soil sample locations.

Soil samples were collected by use of Geoprobe Macro-Core soil samplers with stop-pin systems. Each Macro-Core sampler contained a disposable polyvinyl chloride (PVC) sleeve. Boreholes where the Macro-Core samplers were advanced were within 1 foot of the MIP survey locations. Subsurface soil samples consisted of two 5-gram aliquots placed into two 40-milliliter (mL) vials preserved with sodium bisulfate, and two unpreserved 40-mL vials packed with soil. Samples were submitted for laboratory analyses for selected VOCs, which included TCE, PCE, 1,1-DCE, *trans*-1,2-DCE, *cis*-1,2-DCE, and VC, along with BTEX.

A field sheet was completed for each sample submitted for laboratory analysis (see Appendix C). The field sheets included the following information: sample locations, depth intervals, and analyses to be performed. All soil samples were stored in coolers maintained at or below a temperature of 4 degrees Celsius (°C) pending submittal to the EPA Region 7 laboratory. Table 2 summarizes the subsurface soil samples collected for the ISA.

**TABLE 2**

**SOURCE AREA SUBSURFACE SOIL SAMPLES  
SPORLAN VALVE PLANT #1 SITE  
WASHINGTON, MISSOURI**

<b>Sample Location</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Depth (ft bgs)</b>	<b>EPA Sample Number</b>
MIP-2	10/31/16	1210	4-8	7257-101
MIP-4	10/31/16	1310	20	7257-102
MIP-5	10/31/16	1333	20	7257-103
MIP-16	10/31/16	1445	9.5	7257-104
MIP-17	10/31/16	1458	8.5-9.5	7257-105
MIP-8	10/31/16	1511	8-12	7257-106
MIP-8	10/31/16	1536	20	7257-107
MIP-10	10/31/16	1608	12	7257-108
MIP-10	10/31/16	1636	20	7257-109
MIP-19	10/31/16	1715	10-12	7257-110
MIP-19	10/31/16	1728	13-14	7257-111
MIP-12	11/1/16	0810	4-8	7257-112
MIP-12	11/1/16	0903	24	7257-113
MIP-23	11/1/16	0922	4	7257-114
MIP-23	11/1/16	1005	19-20	7257-115
MIP-22	11/1/16	1018	8	7257-116
MIP-24	11/1/16	1103	20	7257-117
MIP-33	11/1/16	1145	19	7257-118
BKG	11/1/16	1240	8-10	7257-119

Notes:

- BKG Background soil sample from Municipal Well #5 lot
- EPA U.S. Environmental Protection Agency
- ft bgs Feet below ground surface

### Analytical Data Summary

Table D-1 in Appendix D summarizes analytical results from the 19 subsurface soil samples (including the background sample). EPA Region 7 laboratory data from the subsurface soil samples are in Appendix E.

Laboratory analysis of the subsurface soil samples detected eight VOCs: TCE, 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, VC, benzene, ethylbenzene, and total xylenes. TCE was detected in nine samples at concentrations ranging from 7.7 to 2,100 µg/kg, five of which exceeded the EPA Regional Screening Level (RSL) for residential soil of 410 µg/kg (EPA 2016b). One sample (7257-111, collected at MIP-19 at 13-14 feet bgs) exceeded the RSL for industrial soil of 1,900 µg/kg. VC was detected in five samples at concentrations ranging from 17 to 740 µg/kg, three of which exceeded the EPA Superfund Chemical Data Matrix (SCDM) Cancer Risk (CR) screening concentration of 94 µg/kg (EPA 2017) and RSL for residential soil of 59 µg/kg (EPA 2016b). The “J” qualifier indicates the result is an estimate. No other VOC concentration exceeded an EPA SCDM benchmark or RSL for soil. *Cis*-1,2-DCE was detected in six samples at concentrations ranging from 6.4 to 3,900 µg/kg. 1,1-DCE was detected in three samples at concentrations ranging from 15 to 94 µg/kg. *Trans*-1,2-DCE was detected in three samples at concentrations ranging from 5.9 to 210 µg/kg. Ethylbenzene (76 µg/kg), benzene (9.7 µg/kg), and total xylenes (10 µg/kg) were each detected in one sample (separate samples). The background sample did not contain any detectable concentration of a VOC.

### **4.3 GEOPROBE TEMPORARY WELL AND SUMP WATER SAMPLING**

Nine temporary Geoprobe® groundwater wells were installed at the site and sampled by START. Depths of the wells ranged from 9 to 40 feet bgs. Groundwater samples were collected from the wells by use of a Geoprobe Screen Point 16 sampling apparatus containing a 4-foot-long, reusable, stainless steel screen driven directly below the water table or to the maximum depth possible. Groundwater samples were collected through disposable polyethylene tubing inserted into the Geoprobe rods and sampling apparatus by use of a peristaltic pump. The groundwater sampler and rods were decontaminated after sampling at each well location, and new tubing was used for each sample.

In addition, a water sample was collected from a concrete sump at Property ID 125. The sump pump was activated to empty the sump, and then the sump was allowed to recharge with groundwater. A sample was collected by dipping appropriate sample containers into the sump water. The water samples were submitted for analyses for selected VOCs, which included TCE, PCE, 1,1-DCE, *trans*-1,2-DCE, *cis*-1,2-DCE, VC, and BTEX. Each sample consisted of four 40-mL vials preserved with hydrochloric

acid (HCl) to a pH less than 2. All water samples were stored in coolers maintained at or below a temperature of 4 °C pending submittal to the EPA Region 7 laboratory.

A field sheet was completed for each sample submitted for laboratory analysis (see Appendix C). The field sheets included the following information: Property IDs and/or sample locations, sample depths, and analyses to be performed. A field blank and a rinsate blank were also submitted to the laboratory.

Sampling locations are illustrated on Figure 10 in Appendix A. Table 3 summarizes groundwater samples collected during the ISA from temporary wells and the sump.

**TABLE 3**  
**TEMPORARY WELL AND SUMP WATER SAMPLES**  
**SPORLAN VALVE PLANT #1 SITE**  
**WASHINGTON, MISSOURI**

<b>EPA Sample Number</b>	<b>Location</b>	<b>Sample Date</b>	<b>Sample Depth (ft bgs)</b>
7257-301	GPW1=Property ID 120	11/02/16	29.8
7257-302	Property ID 125 Sump Water	11/02/16	Not applicable
7257-303	GPW2=603 Hancock Street (No Property ID)	11/02/16	30
7257-304	GPW3=Property ID 171	11/03/16	40
7257-305	GPW4=Property ID 206	11/03/16	34
7257-306	GPW5=Property ID 203	11/03/16	16
7257-309	GPW Background sample from City Lot at W 9 <sup>th</sup> & Louis Streets	11/05/16	9
7257-310	GPW6=Property ID 158	11/07/16	19
7257-311	GPW7= Property ID 177	11/07/16	19
7257-312	GPW8=Property ID 181	11/07/16	34.6
7257-307	Geoprobe <sup>®</sup> rinsate sample	11/04/16	Not applicable
7257-308-FB	Field Blank	11/04/16	Not applicable

Notes:

EPA U.S. Environmental Protection Agency  
 FB Field blank  
 ft bgs Feet below ground surface  
 GPW Geoprobe water sample

### **Analytical Data Summary**

Table D-2 in Appendix D summarizes analytical results from the 10 groundwater samples (including the sump water sample and background sample), along with the field blank and rinsate sample. EPA Region 7 laboratory data from the groundwater samples are in Appendix E.

Laboratory analysis of the groundwater samples detected four VOCs: TCE, PCE, *cis*-1,2-DCE, and toluene. Concentrations of TCE were detected above the SCDM CR screening concentration of 1.1 µg/L and maximum contaminant level (MCL) of 5.0 µg/L for groundwater in two samples: sample 7257-302 (sump water at Property ID 125) contained a TCE concentration of 58 µg/L, and sample 7257-312 (Geoprobe temporary well 8 at Property ID 181) contained a TCE concentration of 7.3 µg/L. In sample 7257-311 (Geoprobe temporary well 7 at Property ID 177), TCE was detected at 2.1 µg/L, below the MCL but exceeding the SCDM CR screening concentration.

#### **4.4 EXISTING MONITORING WELL SAMPLING**

Twelve existing monitoring wells are on and within 0.125 mile south and southeast of the site. Eleven of the 12 monitoring wells were sampled by START; monitoring well #1 was dry and was not sampled. Depths of the wells ranged from approximately 6.50 to 48.50 feet bgs. These monitoring well locations are illustrated on Figure 10 in Appendix A.

Prior to sampling each monitoring well, depth to groundwater was recorded and water volume in the well was calculated. The wells were purged by use of a peristaltic pump and disposable polyethylene tubing to remove three times the water volume prior to sampling, unless the well was pumped dry. In the event the well was pumped dry, it was allowed to recharge, and then was sampled immediately. Generally, no specialized equipment was required other than devices to monitor flow rates and field parameters of the well discharge. Field parameters (pH, conductivity, dissolved oxygen, oxidation-reduction potential, temperature, and turbidity) were recorded during purging; once field parameters had stabilized (indicating that the purge discharge was representative of aquifer conditions), a groundwater sample was collected by use of the peristaltic pump.

Water samples were collected for analysis for selected VOCs, which included TCE, PCE, 1,1-DCE, *trans*-1,2-DCE, *cis*-1,2-DCE, VC, and BTEX. Each sample was collected in four 40-mL vials and preserved with HCl to a pH less than 2.

A field sheet was completed for each sample submitted for laboratory analysis (see Appendix C). The field sheets included the following information: sample locations, water quality parameters, purge times or estimated purge volumes, and analyses to be performed. All water samples were stored in coolers maintained at or below a temperature of 4 °C pending submittal to the EPA Region 7 laboratory. A trip blank for analysis for VOCs was also submitted to the laboratory. Table 4 summarizes monitoring well samples collected during the ISA.

**TABLE 4**  
**MONITORING WELL SAMPLES**  
**SPORLAN VALVE PLANT #1 SITE**  
**WASHINGTON, MISSOURI**

EPA Sample Number	Well ID	Sample Date	Sample Depth (ft bgs)
NC	MW-1*	NC	NC
7257-313	MW-2	11/16/16	14.44
7257-314	MW-3	11/16/16	23.31
7257-315	MW-4	11/16/16	23.61
7257-316	MW-5	11/16/16	21.98
7257-317	MW-6	11/16/16	32.18
7257-318	MW-7	11/16/16	23.68
7257-319	MW-8	11/16/16	23.73
7257-320	MW-9	11/17/16	27.12
7257-321	MW-10	11/17/16	34.72
7257-322	MW-11	11/17/16	48.17
7257-323	MW-12	11/17/16	48.45
7257-324-FB	Trip Blank	11/17/16	None

Notes:

\* MW-1 was not sampled due to absence of groundwater in the well.

EPA U.S. Environmental Protection Agency  
ft bgs Feet below ground surface  
ID Identification  
MW Monitoring well  
NC Not collected  
TB Trip blank

**Analytical Data Summary**

Table D-3 in Appendix D summarizes analytical results from the monitoring well samples, along with the trip blank. EPA Region 7 laboratory data from the monitoring well samples are in Appendix E.

Laboratory analysis of the groundwater samples detected four VOCs exceeding their MCLs: TCE, 1,1-DCE, *cis*-1,2-DCE, and VC. In all monitoring well samples, TCE concentrations exceeded the SCDM CR screening concentration of 1.1 µg/L and the MCL of 5.0 µg/L, ranging from 11 to 5,900 µg/L, with the

highest concentration detected in MW-8 (sample 7257-319). That sample also contained 1,1-DCE at 150 µg/L, which exceeded the MCL of 7.0 µg/L. In four monitoring well samples, *cis*-1,2-DCE concentrations exceeded the MCL of 70 µg/L, ranging from 290 to 1,700 µg/L, with the highest concentration also detected in MW-8. In three monitoring well samples, VC concentrations exceeded the SCDM CR screening concentration of 0.021 µg/L and the MCL of 2.0 µg/L, ranging from 51 to 1,100 µg/L, with the highest concentration again detected in MW-8.

#### 4.5 MUNICIPAL DRINKING WATER WELL SAMPLING

On December 7, 2016, START collected three drinking water samples from selected municipal drinking water wells within the City of Washington. Those sampling locations are illustrated on Figure 11 in Appendix A.

Groundwater samples from the drinking water wells were collected from spigots nearest the wellheads, prior to any treatment systems. The supply lines/systems were purged for approximately 5 minutes before the samples were collected. Three 40-mL vials preserved with HCl to a pH less than 2 were collected for each sample. The water samples were analyzed for selected VOCs, which included TCE, PCE, 1,1-DCE, *trans*-1,2-DCE, *cis*-1,2-DCE, VC, and BTEX.

A field sheet was completed for each sample submitted for laboratory analysis (see Appendix C). Pertinent data, including analyses to be performed and exact sample locations, were recorded on a field sheet for each sample. All water samples were stored in coolers maintained at or below a temperature of 4 °C pending submittal to the EPA Region 7 laboratory. A trip blank was also submitted to the laboratory. Table 5 summarizes the municipal drinking water samples collected for the ISA.

**TABLE 5**  
**MUNICIPAL DRINKING WATER WELL SAMPLES**  
**SPORLAN VALVE PLANT #1 SITE**  
**WASHINGTON, MISSOURI**

EPA Sample Number	Location	Sample Date
7257-201	Municipal Well #4	12/7/16
7257-202	Municipal Well #6	12/7/16
7257-203	Municipal Well #5	12/7/16
7257-204-FB	Trip Blank	12/7/16

Notes:

EPA U.S. Environmental Protection Agency  
 FB Trip blank

## **Analytical Data Summary**

Table D-4 in Appendix D summarizes analytical results from the three municipal drinking water well samples, including the trip blank. EPA Region 7 laboratory data from the drinking water well samples are in Appendix E. Laboratory results from all municipal drinking water well samples were non-detect for the analyzed VOCs.

### **4.6 SHALLOW SOIL GAS SAMPLING**

Ten shallow soil gas samples were collected in 6-liter stainless steel Summa canisters on November 21 and 29, 2016. Two samples were collected on the former Sporlan Valve Company property; the other eight samples were collected at residential properties.

Soil gas samples were collected in accordance with EPA Region 7 Standard Operating Procedure (SOP) 2318.10A, "Shallow Soil Gas Sampling." A demolition hammer with an SDS-max ground rod driver was used to push a 0.5-inch-diameter steel rod with an expendable aluminum tip to approximately 7 feet bgs. Then, the steel rod was pulled up approximately 1 to 2 feet to expose a subsurface void, and Teflon tubing was attached to the top of the steel rod by use of a 0.25-inch-diameter threaded Swagelok® fitting. A Gilian sampling pump was attached to the free end of the tubing, and operated to purge ambient air from the rod. A Summa canister was attached to disposable polyethylene tubing connected to the top of the rod, and a grab sample was collected by opening the evacuated canister and allowing it to fill. A vacuum gauge was used to determine when an adequate volume of soil gas had been collected.

A field sheet was completed for each sample submitted for laboratory analysis (see Appendix C). The field sheets included the following information: start and end times, initial and final vacuum readings, canister identification numbers, and analyses to be performed. All shallow soil gas samples were submitted to the EPA Region 7 laboratory. Sampling locations are illustrated on Figure 12 in Appendix A. Table 6 summarizes the shallow soil gas samples.

**TABLE 6**

**SHALLOW SOIL GAS SAMPLES  
SPORLAN VALVE PLANT #1 SITE  
WASHINGTON, MISSOURI**

<b>EPA Sample Number</b>	<b>Property ID</b>	<b>Location</b>	<b>Sample Date</b>	<b>Sample Depth (ft bgs)</b>
7257-1	175	613 East 8 <sup>th</sup> Street	11/21/16	5-7
7257-2	None	603 Hancock Street	11/21/16	5-7
7257-3	158	600 East 7 <sup>th</sup> Street	11/21/16	5-7
7257-4	121	605 MacArthur Street	11/21/16	5-7
7257-5	None	Sporlan Valve Property-East 6 <sup>th</sup> Street	11/29/16	5-7
7257-6	None	Sporlan Valve Property-East 6 <sup>th</sup> Street	11/29/16	5-7
7257-7	None	812 MacArthur Street	11/29/16	5-7
7257-8	206	621 East 9 <sup>th</sup> Street	11/29/16	5-7
7257-9	191	803 Schaper Avenue	11/29/16	5-7
7257-10	171	803 MacArthur Street	11/29/16	5-7

Notes:

EPA U.S. Environmental Protection Agency  
 ft bgs Feet below ground surface  
 ID Identification

**Analytical Data Summary**

Table D-5 in Appendix D summarizes analytical results from the 10 shallow soil gas samples. EPA Region 7 laboratory data from the shallow soil gas samples are in Appendix E.

Laboratory analysis of the shallow soil gas samples detected six VOCs: TCE, PCE, benzene, toluene, ethylbenzene, and total xylenes. Sub-slab soil gas screening levels and action levels were derived by EPA Region 7 toxicologists by use of the Vapor Intrusion Screening Level (VISL) Calculator (EPA 2014). All detected VOCs were at concentrations below RSLs. TCE was detected in one sample (7257-6) at 1.93  $\mu\text{g}/\text{m}^3$ , below the RSL of 6.7  $\mu\text{g}/\text{m}^3$ . Two samples (7257-5 and 7257-6) each contained PCE at 0.678  $\mu\text{g}/\text{m}^3$ , below the RSL of 140  $\mu\text{g}/\text{m}^3$ . TCE and PCE detections occurred in samples collected on the Sporlan Valve property. Eight samples contained benzene at concentrations ranging from 0.383 to 1.09  $\mu\text{g}/\text{m}^3$ . The RSL for benzene is 12  $\mu\text{g}/\text{m}^3$ . One sample (7257-1) contained toluene, ethylbenzene, and total xylenes at 48.2, 19.3, and 163.3  $\mu\text{g}/\text{m}^3$ , respectively. RSLs for toluene, ethylbenzene, and total xylenes are 17,333, 36.7, and 333.3  $\mu\text{g}/\text{m}^3$ , respectively.

#### 4.7 VI SAMPLING

VI sampling at residential properties near the site began in August 2016 and is ongoing. Sub-slab soil gas, indoor air, and outdoor ambient air samples have been collected for this ISA and analyzed for TCE, PCE, and other selected chlorinated VOCs and BTEX. Quarterly sampling at these properties is planned for at least 1 year. Sampling results aid determination whether VMSs are warranted in homes (to be installed by the PRP's contactor) to reduce indoor inhalation exposure to site-related VOCs. To date, four new properties have qualified for VMS installation since quarterly sampling began, based on sub-slab soil gas and/or indoor air sample results exceeding action level(s) for TCE (67 and 2  $\mu\text{g}/\text{m}^3$ , respectively). VI sampling and analytical results from the first quarterly VI assessment activity are described in a report by Tetra Tech START dated March 22, 2017 (Tetra Tech 2017). Follow-up quarterly sampling reports will also be prepared and submitted to EPA.

## **5.0 HAZARD RANKING SYSTEM FACTORS**

This section discusses source(s) of contamination and contaminant migration pathways evaluated under the Hazard Ranking System (HRS).

### **5.1 SOURCES OF CONTAMINATION**

TCE was used for degreasing processes at the former Sporlan Valve Plant #1. Releases of TCE at the site possibly occurring over a period of several decades have resulted in contamination of soil and shallow groundwater beneath the site. Historical soil data indicate presence of TCE at the site at concentrations as high as 2,710 µg/kg in surface samples and 9,390 µg/kg in subsurface samples (EPA 2016a). Based on current sample data and review of 3D TCE plume models (Figures 4 through 9 in Appendix A), the impacted area encompasses approximately 31,200 ft<sup>2</sup>. Depths range from approximately 9.5 to 20 feet bgs, with average depth of 16 feet bgs. Estimated volume of impacted soil is approximately 18,500 yd<sup>3</sup>.

### **5.2 GROUNDWATER PATHWAY**

This section discusses the groundwater pathway.

#### **5.2.1 Hydrogeological Setting**

Hydrogeology of the area is discussed in Section 2.3.

#### **5.2.2 Groundwater Targets**

The City of Washington obtains drinking water from a system of groundwater wells drawing from the Ozark Aquifer (MDNR 2016). Municipal Well #4, the drinking water well nearest to the site, is within 1 mile of the Sporlan Valve property (approximately six blocks, or 0.4 mile east of the site; see Figure 11 in Appendix A). Well #4 yields 200 gallons per minute (gpm) with a 360-foot drawdown. MGS has determined that the site may lie within the area of influence of Well #4 during pumping intervals.

Two bedrock faults are near the site: the Washington Fault, 0.7 mile to the west; and the St. Johns Fault, 1.6 miles to the northwest. Presence of these faults and their orientation indicates likelihood that fractured bedrock is present beneath the Sporlan Valve site. Because the local bedrock is likely fractured, and no known aquitards are between the unconsolidated zone and the bedrock aquifer, the unconsolidated aquifer and the Ozark Aquifer are likely interconnected. Therefore, chlorinated solvent contamination from the site may pose a future threat to the public well system (MDNR 2016).

No detections of TCE or related breakdown products have been reported in the Washington public water system. The MDNR water wells database indicates six domestic bedrock water wells are within 1 mile of the site (MDNR 2016). Multiple attempts occurred to locate these wells and their owners to acquire access for sampling; however, in each case, either locational data regarding the well was not correct in the database, or the property owner indicated that no well existed.

Table 7 lists estimated populations within 4 miles of the site that use groundwater as a drinking water source from both public and private wells. Non-community public, industrial, and irrigation wells are not included, because these are not considered to be used for drinking. Approximately 15,706 people are using groundwater within 4 miles of the site for drinking water purposes (MDNR 2016).

**TABLE 7**  
**ESTIMATED POPULATION SERVED BY GROUNDWATER**  
**WITHIN 4 MILES OF THE SITE**  
**SPORLAN VALVE PLANT #1 SITE**  
**WASHINGTON, MISSOURI**

<b>Distance (Miles)</b>	<b>Number of Private Wells</b>	<b>People Served by Private Wells</b>	<b>Number of Public Wells</b>	<b>People Served by Public Wells</b>	<b>Total People Served</b>
0 to ¼	0	0	0	0	0
>¼ to ½	4	10	1	1,324	1,334
>½ to 1	6	15	1	1,324	1,339
>1 to 2	39	98	5	6,620	6,718
>2 to 3	93	233	3	3,523	3,756
>3 to 4	144	360	3	2,199	2,559
<b>TOTAL</b>	<b>286</b>	<b>716</b>	<b>13</b>	<b>14,990</b>	<b>15,706</b>

Note:

The number of people served per private well was estimated by multiplying the average of 2.5 persons per household in Franklin County by the number of wells within a distance category (MDNR 2016).

### 5.2.3 Groundwater Pathway Conclusions

Groundwater sampling from 2007 to present has documented a release of VOCs, including TCE and its breakdown products, to shallow groundwater at levels significantly above background and EPA MCLs. Concentrations exceeding 10,000 µg/L have been measured at MW-3 near the southern boundary along Seventh Street. Considering the high TCE concentrations in groundwater near the source area(s), it is possible that TCE has migrated into the sedimentary rock aquifer; however, no bedrock wells are at or near the site from which samples could be collected to determine whether this has occurred. The Phase II

Limited Soil Investigation by SECOR in 2004 concluded that “The bedrock aquifer may be contaminated with the TCE that was detected in the soil samples” (MDNR 2016).

Based on monitoring well network data, the TCE plume is migrating south and southeast from the source area(s). TCE concentrations in groundwater decrease fairly rapidly with distance at the depths monitored, falling from approximately 5,000-10,000 µg/L at the southern boundary of the former Sporlan Valve property to 200 µg/L at MW-11 approximately 300 feet to the south, and to 260 µg/L at MW-10 200 feet to the southeast. *Cis*-1,2-DCE and VC are present as TCE degradation products, indicating occurrence of anaerobic reductive dehalogenation to some extent, possibly accelerated by co-release of petroleum hydrocarbons from the leaking UST removed from the site (MDNR 2016).

All groundwater sampling to date has been limited to the unconsolidated saturated zone above the bedrock aquifer. No known private drinking water wells are in the vicinity of the site. Whether the bedrock aquifer has been impacted is unknown. The City of Washington obtains drinking water from the bedrock aquifer, and the City of Washington Public Water Supply serves approximately 14,990 people within 4 miles of the site. MGS conducted a review of existing site characterization data, determined that the site may pose a potential threat to the City of Washington public drinking water wells, and recommended further bedrock aquifer investigation (MDNR 2016). In December 2016, START sampled the three municipal wells closest to the site (Municipal Wells #4, #5, and #6) for analyses for TCE (and degradation products) and BTEX. All analytes of interest were non-detect in all three municipal well samples collected during this ISA. Based on the recent data generated from this ISA, along with historical data, an updated groundwater plume model was generated (see Figure 13 in Appendix A).

### **5.3 SURFACE WATER PATHWAY**

Section 5.3 discusses the surface water pathway. No surface water sampling was conducted as part of the ISA investigation.

#### **5.3.1 Hydrological Setting**

Surface water runoff from the site flows southeast for approximately 0.2 mile before entering Busch Creek. This potential point of entry (PPE) lies within the SE <sup>1</sup>/<sub>4</sub>, NE <sup>1</sup>/<sub>4</sub>, SE <sup>1</sup>/<sub>4</sub> of Section 22, Township 44 North, Range 1 West of the Washington West 7.5-minute quadrangle. From the PPE, surface water flows east along Busch Creek for approximately 3.3 miles before reaching the Missouri River. From this point, the Missouri River flows roughly 11.7 miles east before reaching the 15-mile downstream limit. The 15-mile

downstream limit for this site is approximately 0.15 mile north of Missouri River mile marker 53 (MDNR 2016).

### **5.3.2 Surface Water Targets**

No known drinking water intakes are on surface water bodies within 15 miles downstream of the site. The surface water drainage area upgradient of the site encompasses less than 50 acres. The 2-year, 24-hour rainfall is approximately 3.5 inches (MDNR 2016). Wetlands associated with the Missouri River, and to a lesser extent Busch Creek, are within the 15-mile downstream target distance limit. According to MDNR's stream classifications and use designations, Busch Creek is a Class C stream and qualifies for application of water quality standards regarding livestock watering, protection of aquatic life and human health, and Category B whole body contact recreation. The Missouri River is a fishery, and classified as a Class P stream that qualifies for protection regarding the aforementioned uses, along with irrigation, drinking water, and industrial water use (MDNR 2016).

### **5.3.3 Surface Water Pathway Conclusions**

Runoff from the site flows into Busch Creek south of E. Ninth Street, and then into the Missouri River. No drinking water intakes are within the 15-mile target distance limit, although wetlands are along the Missouri River, which is also a fishery. No surface water sampling occurred as part of the ISA investigation. Potential exists for shallow groundwater contaminated with chlorinated solvents to discharge from the site to Busch Creek; however, due to low contaminant concentrations at the downgradient portion of the plume, proximity to the creek, and lack of nearby targets, this migration pathway is not considered a significant threat to human health or the environment.

## **5.4 SOIL EXPOSURE AND AIR PATHWAYS**

Section 5.4 discusses the soil exposure and air pathways. VI exposure risks and associated sampling data are also discussed.

### **5.4.1 Physical Conditions**

Soil at the site is Menfro silt loam. The soil is composed of roughly 22 to 29 percent clay. Residuum consists of clay, chert, and sand derived from weathered Ordovician-age bedrock. The unconsolidated sediments range in thickness from 10 to 40 feet near the site. Hydraulic conductivity of Menfro silt loam is

roughly  $9 \times 10^{-4}$  to  $3 \times 10^{-4}$  centimeters per second (cm/sec). Groundwater flow direction in overburden is most likely toward the south, the topographic downslope direction (MDNR 2016).

#### **5.4.2 Soil and Air Targets**

Latest available census data indicate population within 0.25 mile of the site is 742, and within 0.5 mile of the site is 2,270 (Missouri Census Data Center [MCDC] 2017). The Sporlan Valve site is within a residential neighborhood. Approximately 40 residences and one apartment complex (Macarthur Park Apartments) are within 200 feet of contaminated surface soil at the site. Utility employees working at areas where TCE was released at the site may come into direct contact with TCE-contaminated soil (MDNR 2016). Residents in houses above the TCE-contaminated groundwater plume may also be exposed via VI. No known threatened or endangered species occur at the site.

#### **5.4.3 Soil Exposure and Air Pathway Conclusions**

No surface soil samples were collected as part of this ISA. In 2012, Ramboll Environ completed a Phase III supplemental investigation during which TCE was detected in surface soil samples on site at concentrations ranging from 66.2 to 2,710  $\mu\text{g}/\text{kg}$ . The Sporlan Valve site is within a residential neighborhood. Approximately 40 residences and one apartment complex (Macarthur Park Apartments) are within 200 feet of contaminated surface soil at the site. Latest available census data indicate population within 0.25 mile of the site is 742, and within 0.5 mile of the site is 2,270 (MCDC 2017). Workers excavating at areas where TCE was released may come into direct contact with TCE-contaminated soil at the site (MDNR 2016).

Residents in houses above the TCE-contaminated groundwater plume may also be exposed via VI. VI sampling at residential properties near the site began in August 2016 and is ongoing. Sub-slab soil gas, indoor air, and outdoor ambient air samples have been collected and analyzed for TCE, PCE, and other selected chlorinated VOCs and BTEX. Quarterly sampling at these properties is planned for at least 1 year. Sampling results are aiding determination whether VMS installations in homes are warranted due to sub-slab contamination. To date, four new properties have qualified for VMS installation based on sub-slab soil gas and/or indoor air sample results exceeding action levels for TCE.

No release to ambient air is believed to be occurring at the site that would present a threat to human health or the environment, or significantly impact HRS scoring.

## 6.0 EMERGENCY RESPONSE AND REMOVAL ACTION CONSIDERATIONS

The National Contingency Plan [40 *Code of Federal Regulations* [CFR] 300.415(b) (2)] authorizes EPA to consider emergency response actions at facilities that pose an imminent threat to human health or the environment. During sampling for this ISA, in five soil samples collected at the source area, TCE concentrations were found to exceed the residential RSL of 410 µg/kg, and a detection up to 2,100 µg/kg in one sample also exceeded the industrial RSL for TCE of 1,900 µg/kg. Previous sampling had indicated TCE contamination at the site at concentrations as high as 2,710 µg/kg in surface samples and 9,390 µg/kg in subsurface samples. VC was also detected in five samples at concentrations ranging from 17 to 740 µg/kg, in three of which VC levels exceeded the SCDM CR screening concentration of 94 µg/kg and the RSL for residential soil of 59 µg/kg. EPA Region 7 risk assessors have suggested Removal Management Levels (RML) for TCE of 4.1 milligrams per kilogram (mg/kg) (4,100 µg/kg) for residential settings and 19 mg/kg (19,000 µg/kg) for industrial settings. Analytical data from soils collected at the site may be evaluated by EPA risk assessors to determine whether a removal action, possibly involving excavation of contaminated soils, is warranted. Additional targeted sampling at selected areas may be necessary to determine if referral to EPA Region 7 for removal action is warranted.

Elevated levels of TCE have been detected in shallow groundwater at the site. However, no drinking water wells are known to be operating within the approximate footprint of the plume. The highest reported level of TCE in groundwater at the site has been in monitoring well MW-3 at 12,100 µg/L (September 2009). The most recent sample from MW-3 contained TCE at 3,100 µg/L. Highest TCE levels reported in monitoring wells sampled during the fall 2016 ISA sampling effort were in MW-8 and MW-9, at 5,900 and 5,000 µg/L, respectively. During this effort, TCE was detected in all 11 monitoring well samples at levels above the MCL of 5 µg/L. Eight Geoprobe temporary groundwater monitoring wells were also sampled during this effort. TCE was detected at two locations (GPW-7 at Property ID 177, and GPW-8 at Property ID 181) along the north side of East 8th Street, at 2.1 and 7.3 µg/L, respectively. Also, one sump water sample was collected from the basement at Property ID 125; that sample contained a TCE concentration of 58 µg/L.

The three municipal drinking water wells closest to the site were sampled during this ISA sampling effort; no chlorinated VOCs or BTEX compounds were detected in any of the samples. The municipal drinking water wells are completed in the Ozark Aquifer at depths of approximately 360 feet bgs. No known private drinking water wells are in the vicinity of the site. Currently, the TCE-contaminated groundwater plume appears confined to the shallow groundwater aquifer, migrating to the south and east.

CERCLA and the NCP both contain provisions that support and encourage early actions to mitigate actual and potential threats to human health associated with VI. According to EPA OSWER Publication 9200.2-154 – Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA 2015), for sites not on the NPL, EPA may use its removal authority under CERCLA to undertake early action to mitigate VI threats. Under this authority, EPA issued a UAO to SV Land LLC, requiring removal action to abate imminent and substantial endangerment to the public health or welfare or the environment that may be presented by actual or threatened release of hazardous substances at or from the site. Under this Order, SV Land LLC has retained a contractor, Ramboll Environ, to oversee installation of VMSs in selected homes within a designated inclusion zone around the site perimeter, for preemptive mitigation of potential for VI into those structures. Initially, this activity was planned to focus on the 11 properties nearest the south site perimeter along East Seventh Street due to their proximity to the known groundwater plume (Property IDs 145 to 155). Performance sampling of indoor air at these properties 30 days after the VMSs had been installed was also required. These activities began in fall 2016.

In conjunction with the enforcement action and as an element of the current ISA activities, EPA tasked START to conduct VI assessment sampling at additional residences around the site perimeter beyond the PRP's initial property inclusion zone. These activities began in August 2016 and are ongoing, with sampling events conducted quarterly. Documentation of these activities and corresponding sample results is occurring in separate VI assessment reports. To date, four new properties have qualified for VMS installation based on sub-slab soil gas and/or indoor air sample results exceeding action level(s) for TCE (67 and 2  $\mu\text{g}/\text{m}^3$ , respectively). At one residence, TCE levels in sub-slab soil gas samples have been as high as 4,800  $\mu\text{g}/\text{m}^3$ , and as high as 6.7  $\mu\text{g}/\text{m}^3$  in indoor air samples, documenting a complete VI exposure pathway. Based on these sample results, the PRP has expanded the initial inclusion zone for residences eligible for VMS installation. Several additional residences have been included based on their close proximity to residences where VI action levels have been exceeded.

The primary pathway of concern for the site is intrusion of TCE vapors from shallow groundwater to indoor air. Installation of a groundwater extraction system may be considered as a potential removal action alternative to create a cone of depression and possibly limit VI risks.

## 7.0 SUMMARY

EPA Region 7, under authority of CERCLA and SARA, tasked Tetra Tech to conduct an ISA at the Sporlan Valve Plant #1 site in Washington, Missouri, under START 4 Contract Number EP-S7-13-06, Task Order Number 0150.

From 1939 until approximately 2005, the site was the location of the Sporlan Valve Plant #1, where valves for the refrigeration industry were produced. The Sporlan Valve Company was acquired by the Parker Hannifin Corporation of Cleveland, Ohio, via merger in October 2004. The plant continued to operate at the 611 E. Seventh Street location until approximately 2005. Exact date of plant closure is unknown. The property is now owned by SV Land LLC and is a vacant 4-acre parcel surrounded by a residential neighborhood. Prior to its demolition in 2011, an 80,000-square-foot brick building on a concrete slab stood at the site. The building was constructed in 1939, with continuous expansion through 1968. Operations at the plant included plating, degreasing, machining, brazing, assembling, and testing. Degreasing operations included use of the chlorinated solvent TCE.

Over the course of the facility's manufacturing history, three ASTs, ranging in size from 200 to 2,000 gallons, were used to store TCE for the plant's degreasing processes. The 2,000-gallon AST was north of the former manufacturing building and positioned on a concrete pad with no secondary containment. Three USTs used to store fuel oil were also present at the site. The fuel oil USTs ranged in size from 2,000 to 10,000 gallons.

An unknown amount of TCE was released from the former valve factory over an unknown period of time. Existing monitoring well data indicate migration of TCE-contaminated shallow groundwater to the south and east, downgradient of the site.

In October and November 2016, START conducted an MIP survey and sampling of subsurface soil, groundwater monitoring wells and sump water, shallow soil gas, and municipal drinking water wells for the ISA. Quarterly VI sampling of residential sub-slab soil gas and indoor air at the site began in August 2016 and is ongoing, as a component of the ISA.

The MIP was used as a screening tool in an attempt to better delineate the extent of TCE contamination in subsurface soils at the site. EPA Region 7's Geoprobe was used to advance the MIP into subsurface soil at 37 survey locations to obtain continuous logs of chlorinated VOCs in soil. The logs provided by the MIP assessment were used to assist with selection of locations and depths for subsurface soil sampling for laboratory analysis for TCE and related chlorinated VOCs, along with BTEX.

Laboratory analyses of subsurface soil samples collected at 19 locations (including one background sample) detected eight VOCs: TCE, 1,1-DCE, *cis*-1,2-DCE, *trans*-1,2-DCE, VC, benzene, ethylbenzene, and total xylenes. Concentrations of TCE in five samples exceeded the RSL for residential soil. TCE concentration in one sample (collected at MIP-19 at 13-14 feet bgs) exceeded the RSL for industrial soil. VC was detected in three samples at concentrations exceeding the EPA SCDM CR screening concentration and RSL for residential soil. No other VOC concentration exceeded an EPA SCDM benchmark or RSL for soil. *Cis*-1,2-DCE was detected in six samples, 1,1-DCE was detected in three samples, *trans*-1,2-DCE was detected in three samples, and ethylbenzene, benzene, and total xylenes were each detected in one sample (separate samples).

Laboratory analysis of groundwater samples collected from nine Geoprobe temporary wells and one sump detected four VOCs: TCE, PCE, *cis*-1,2-DCE, and toluene. Concentrations of TCE were detected above the SCDM CR screening concentration and MCL at two locations: Property ID 125 (sump water) and Property ID 181 (Geoprobe well 8 [GPW-8]). At Property ID 177 (Geoprobe well 7 [GPW-7]), TCE was detected at concentration below the MCL but exceeding the SCDM CR screening concentration.

Laboratory analysis of groundwater samples collected from existing monitoring wells detected four VOCs exceeding MCLs: TCE, 1,1-DCE, *cis*-1,2-DCE, and VC. In all monitoring well samples, TCE concentrations exceeded the SCDM CR screening concentration and the MCL, with the highest concentration detected in MW-8. That sample also contained 1,1-DCE concentration exceeding the MCL. In four monitoring well samples, *cis*-1,2-DCE concentrations exceeded the MCL, with the highest concentration also detected in MW-8. In three monitoring well samples, VC concentrations exceeded the SCDM CR screening concentration and the MCL, with the highest concentration again detected in MW-8.

Laboratory analysis of all municipal drinking water well samples were non-detect for the analyzed VOCs.

Laboratory analysis of shallow soil gas samples detected six VOCs: TCE, PCE, benzene, toluene, ethylbenzene, and total xylenes. Sub-slab soil gas screening levels and action levels were derived by EPA Region 7 toxicologists by use of the VISL Calculator (EPA 2014). All detected VOCs were below RSLs. TCE was detected in sample 7257-6. Two samples (7257-5 and 7257-6) contained PCE. The TCE and PCE detections were in samples collected on the Sporlan Valve property. Eight samples contained reported benzene concentrations, and one sample (7257-1) contained toluene, ethylbenzene, and total xylenes.

VI sampling at residential properties near the site began in August 2016 and is ongoing. Sub-slab soil gas, indoor air, and outdoor ambient air samples have been collected and analyzed for TCE, PCE, and other selected chlorinated VOCs and BTEX. Quarterly VI sampling of these properties is planned for at least 1 year. Sampling results are aiding determination whether installations of VMSs are warranted in homes due to sub-slab contamination. To date, four new properties have qualified for VMS installation based on sub-slab soil gas and/or indoor air sample results exceeding action level(s) for TCE (67 and 2  $\mu\text{g}/\text{m}^3$ , respectively).

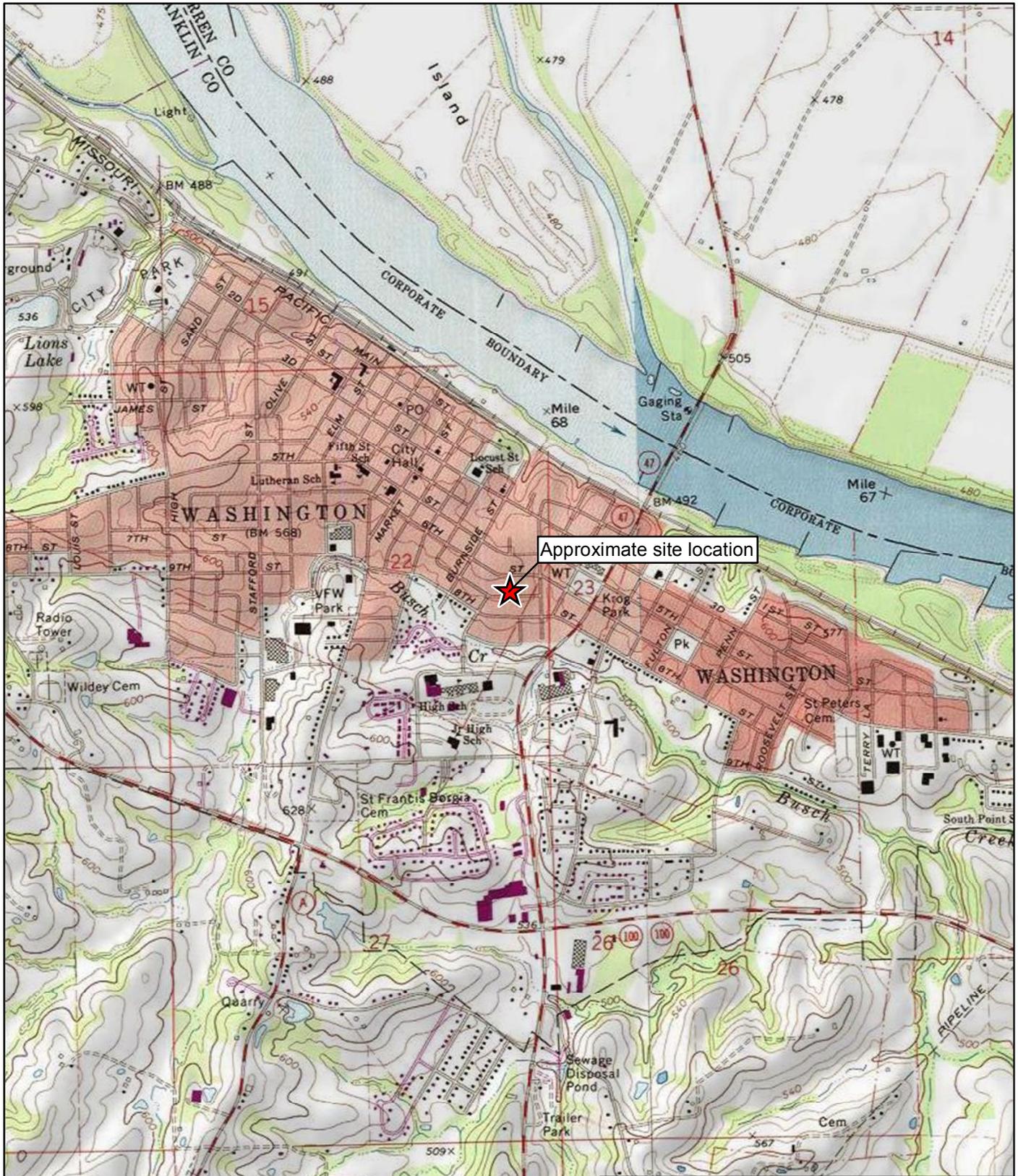
Analytical data from soil and groundwater samples may be evaluated by EPA risk assessors to determine whether a removal action, potentially involving installation of a groundwater extraction system and/or excavation of contaminated soil, is warranted. Additional soil and groundwater samples may be required to further delineate off-site contamination.

## 8.0 REFERENCES

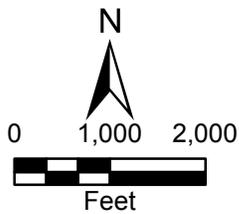
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**APPENDIX A**

**FIGURES**



Approximate site location



Sporlan Valve Plant #1 Site  
 611 East Seventh Street  
 Washington, Missouri

**Figure 1**  
 Site Location Map



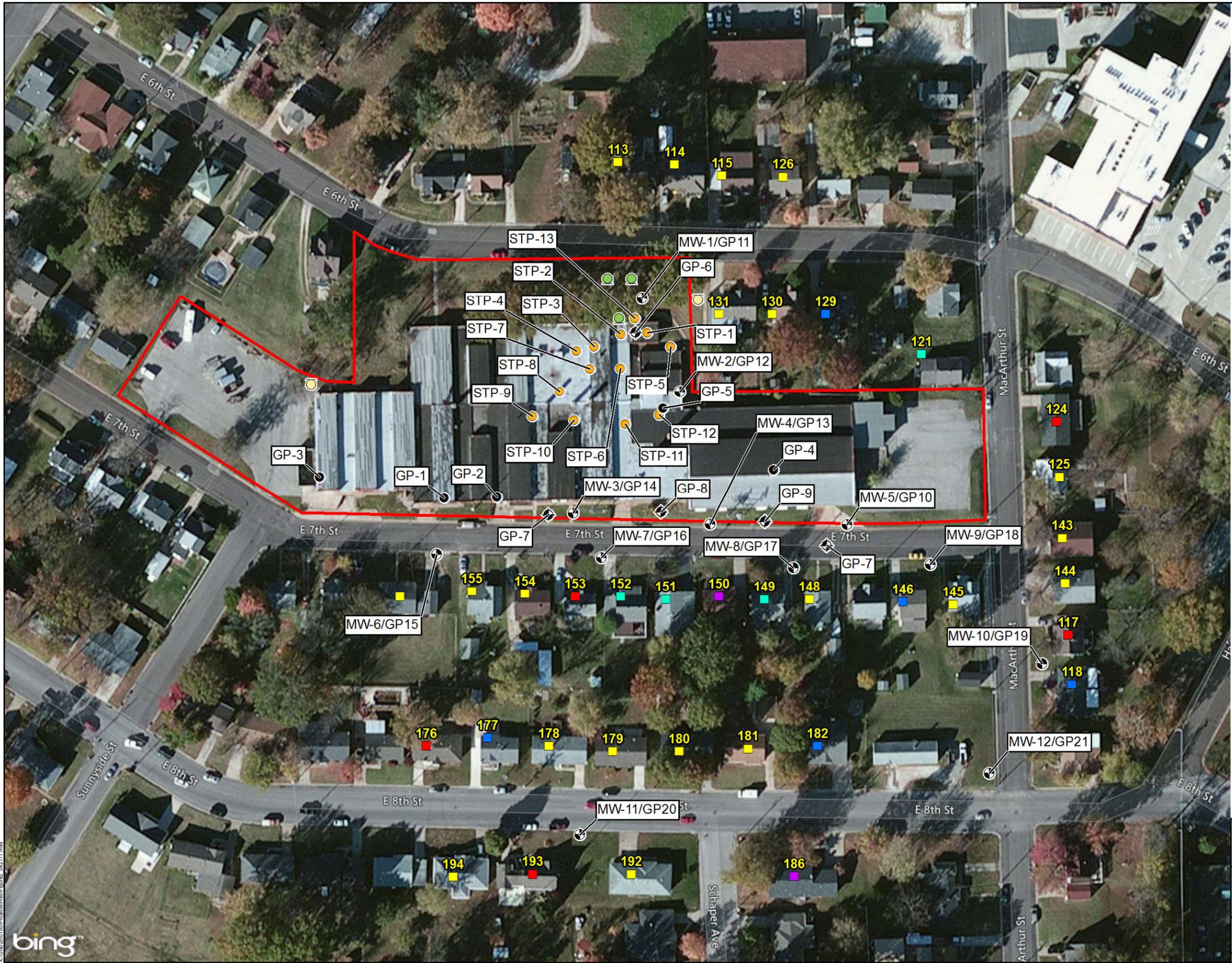
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Source: USGS 7.5 Minute Topo Quad: Washington East, MO, 1972; Washington West, MO, 1973

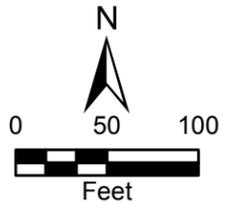
Date: 7/7/2016

Drawn By: Clayton Hayes

Project No: X9025.16.0150.000



- Legend**
- Aboveground storage tank location
  - Monitoring well location
  - Soil probe location
  - Soil test pit location
  - Temporary well location
- Vapor intrusion (VI) sample location**
- Parcel where access for sampling was requested, but not granted.
  - All VOCs below reporting limit
  - VOCs above reporting limit, but below screening levels
  - VOCs between screening level and action level
  - VOCs above action level
  - Underground storage tank location
  - Site boundary
  - 125** Property location ID
  - GP Geoprobe
  - VOC Volatile organic compound



Source: ESRI, ArcGIS Online Maps, Bing Hybrid, 2014

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

**Figure 2**  
 Previous Sampling Locations  
 and Site Layout

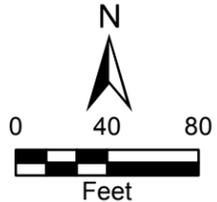


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- Legend
- MIP Location
  - MIP Location with Subsurface Soil Sample
  - TCE Exceeding RSL
  - ▬ Site Boundary
- MIP Membrane Interface Probe  
 RSL Regional Screening Level  
 TCE Trichloroethene



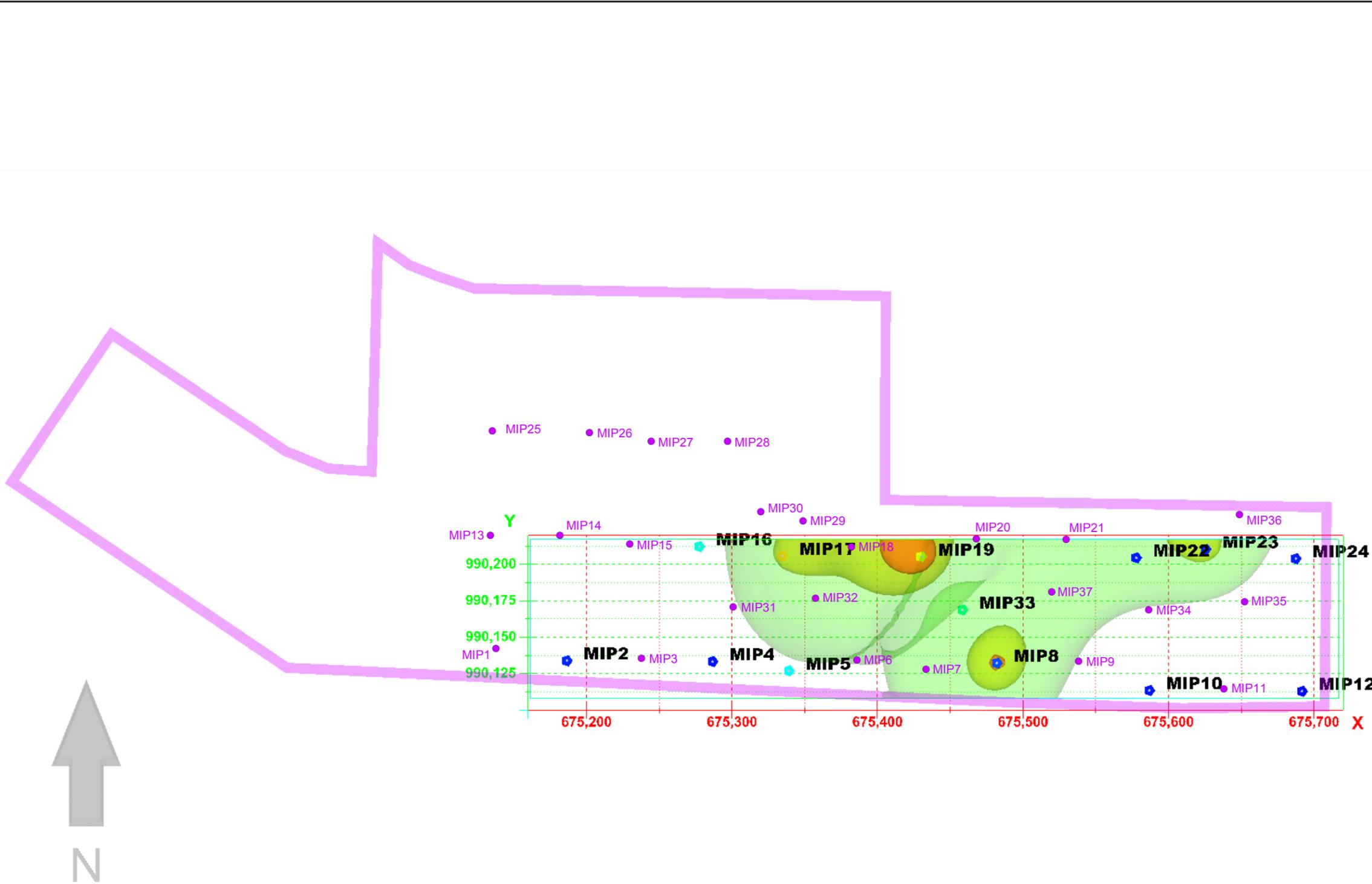
Source: ESRI, Data Maps, World Imagery, 2015

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

**Figure 3**  
 MIP Survey and Subsurface  
 Soil Sampling Locations

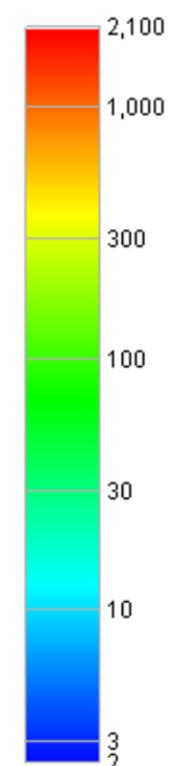


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Legend

TCE Concentration (ppb)



- MIP location where no subsurface soil sample was collected
- MIP Membrane interface probe
- ppb Parts per billion
- TCE Trichloroethene

Notes:

- No subsurface soil samples were collected at MIP survey locations 1, 3, 6, 7, 9, 11, 13-15, 18, 20, 21, 25-32, and 34-37; no quantitative data was generated.
- The information in the 3D model was generated by using the State Plane projection Missouri East 2401 Feet; Datum NAD1983.
- All the values given in the X, Y, Z planes are in feet; where X is the X coordinate in feet (longitude), and Y is the Y coordinate in feet (latitude).

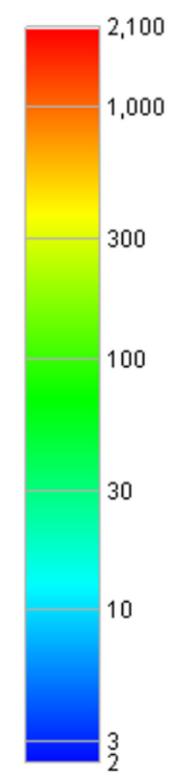
NOT TO SCALE

<p>Source: Tetra Tech, Inc., Nov 2016</p> <p>Sporlan Valve Plant # 1 Site 611 East Seventh Street Washington, Missouri</p>
<p><b>Figure 4</b> 3D TCE Soil Subsurface Model (Top View)</p>

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Legend

TCE Concentration (ppb)



MIP Membrane interface probe  
 ppb Parts per billion  
 TCE Trichloroethene

Notes:

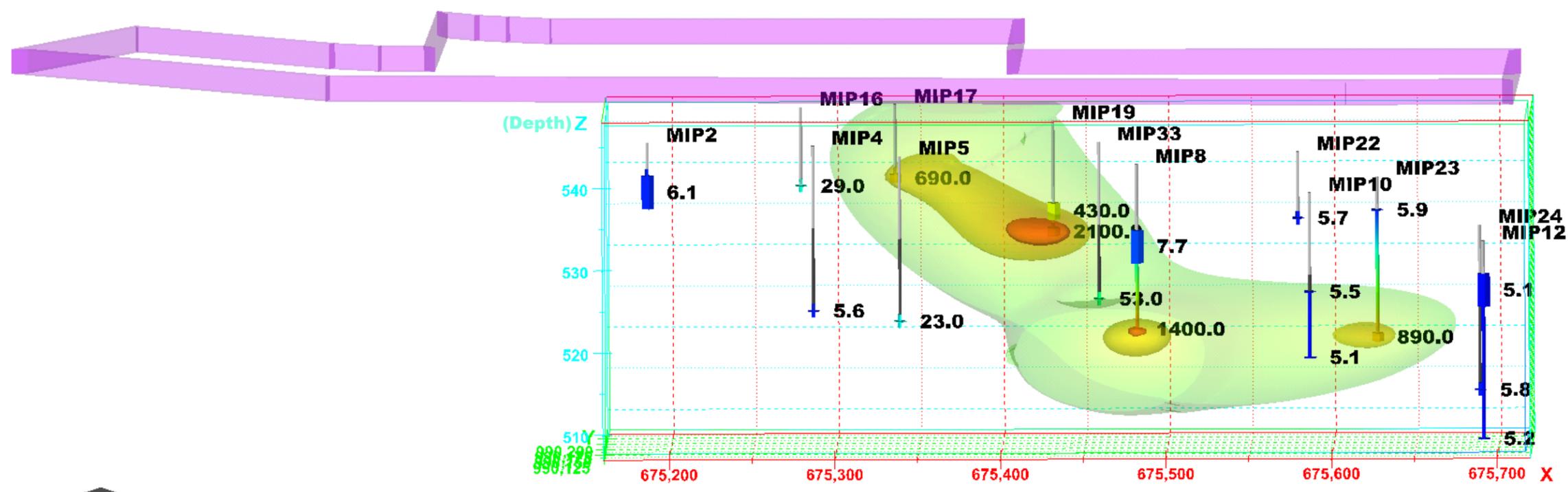
- No subsurface soil samples were collected at MIP survey locations 1, 3, 6, 7, 9, 11, 13-15, 18, 20, 21, 25-32, and 34-37; no quantitative data was generated.
- The information in the 3D model was generated by using the State Plane projection Missouri East 2401 Feet; Datum NAD1983.
- All the values given in the X, Y, Z planes are in feet; where X is the X coordinate in feet (longitude), Y is the Y coordinate in feet (latitude), and Z is the depth in feet below ground surface.

NOT TO SCALE

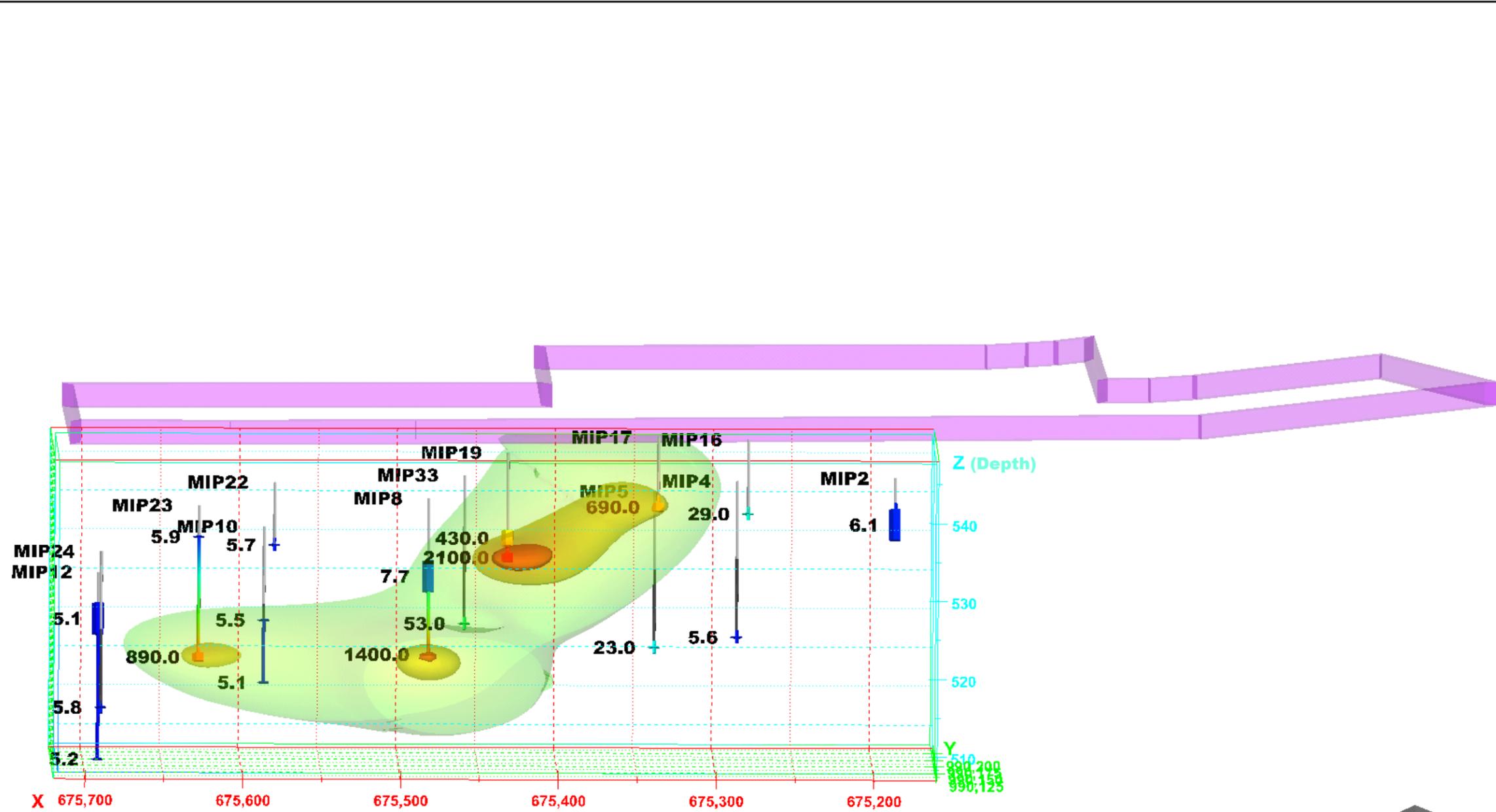
Source: Tetra Tech, Inc., Nov 2016

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

**Figure 5**  
 3D TCE Soil Subsurface Model  
 (S to N View)



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**Legend**

TCE Concentration (ppb)

2,100  
1,000  
300  
100  
30  
10  
3  
2

MIP Membrane interface probe  
ppb Parts per billion  
TCE Trichloroethene

**Notes:**

- No subsurface soil samples were collected at MIP survey locations 1, 3, 6, 7, 9, 11, 13-15, 18, 20, 21, 25-32, and 34-37; no quantitative data was generated.
- The information in the 3D model was generated by using the State Plane projection Missouri East 2401 Feet; Datum NAD1983.
- All the values given in the X, Y, Z planes are in feet; where X is the X coordinate in feet (longitude), Y is the Y coordinate in feet (latitude), and Z is the depth in feet below ground surface.

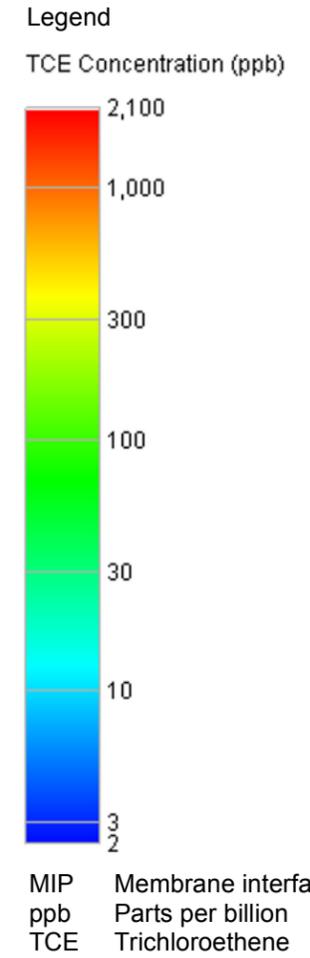
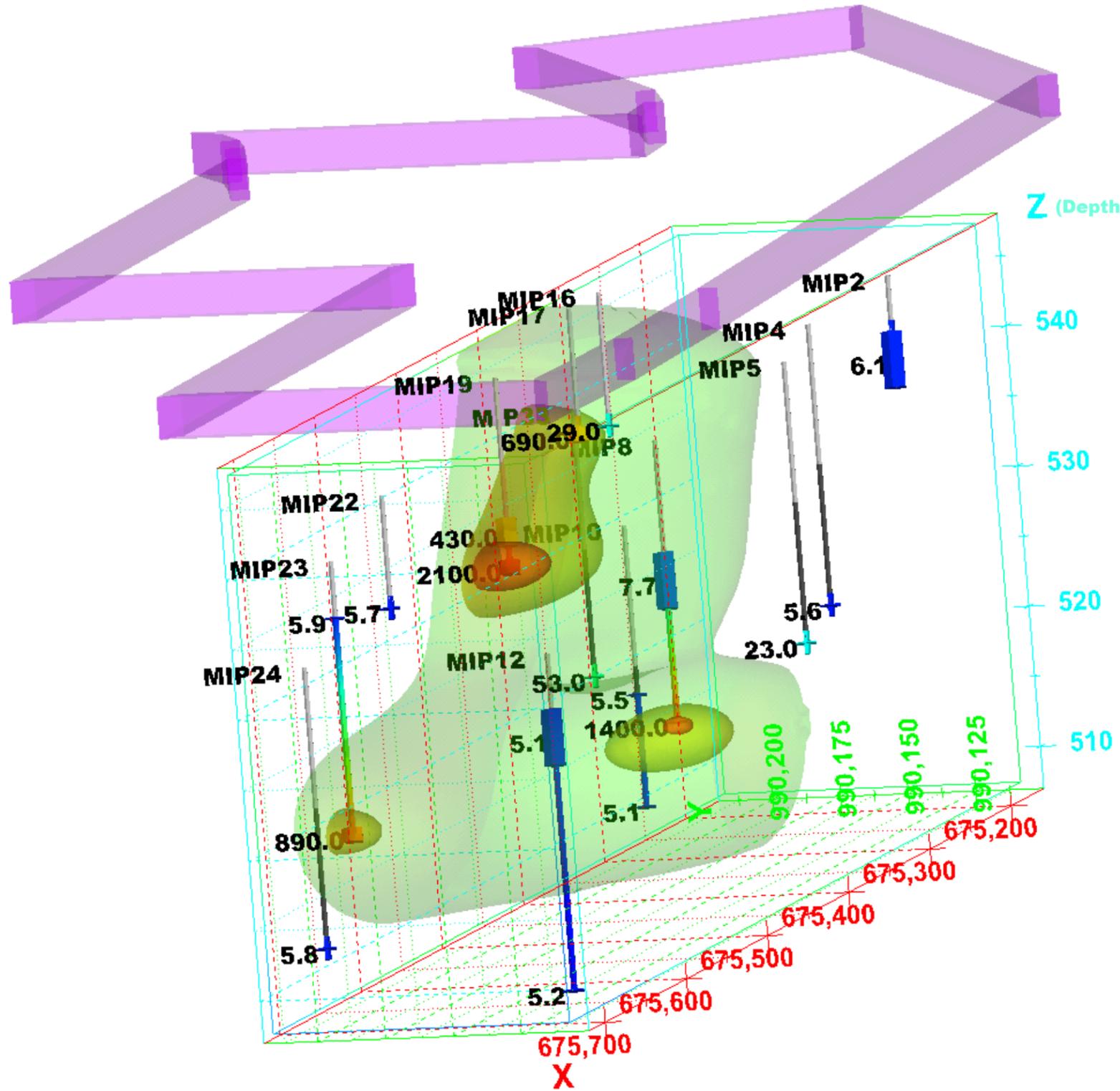
NOT TO SCALE

Source: Tetra Tech, Inc., Nov 2016

Sporlan Valve Plant # 1 Site  
611 East Seventh Street  
Washington, Missouri

**Figure 6**  
3D TCE Soil Subsurface Model  
(N to S View)

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Notes:

- No subsurface soil samples were collected at MIP survey locations 1, 3, 6, 7, 9, 11, 13-15, 18, 20, 21, 25-32, and 34-37; no quantitative data was generated.
- The information in the 3D model was generated by using the State Plane projection Missouri East 2401 Feet; Datum NAD1983.
- All the values given in the X, Y, Z planes are in feet; where X is the X coordinate in feet (longitude), Y is the Y coordinate in feet (latitude), and Z is the depth in feet below ground surface.

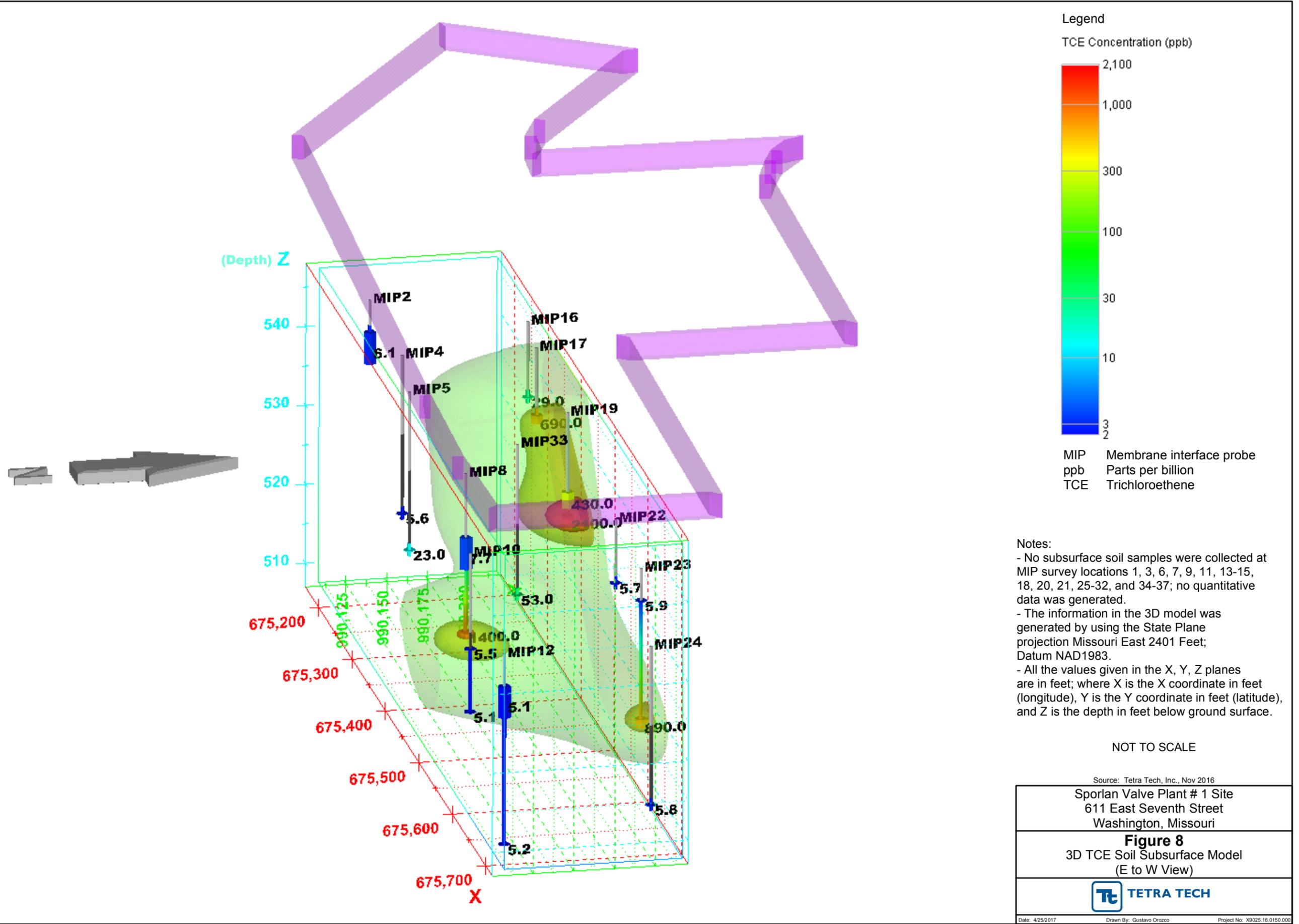
NOT TO SCALE

Source: Tetra Tech, Inc., Nov 2016

Sporlan Valve Plant # 1 Site  
611 East Seventh Street  
Washington, Missouri

**Figure 7**  
3D TCE Soil Subsurface Model  
(W to E View)

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Legend  
 TCE Concentration (ppb)

2,100  
 1,000  
 300  
 100  
 30  
 10  
 3  
 2

MIP Membrane interface probe  
 ppb Parts per billion  
 TCE Trichloroethene

Notes:

- No subsurface soil samples were collected at MIP survey locations 1, 3, 6, 7, 9, 11, 13-15, 18, 20, 21, 25-32, and 34-37; no quantitative data was generated.
- The information in the 3D model was generated by using the State Plane projection Missouri East 2401 Feet; Datum NAD1983.
- All the values given in the X, Y, Z planes are in feet; where X is the X coordinate in feet (longitude), Y is the Y coordinate in feet (latitude), and Z is the depth in feet below ground surface.

NOT TO SCALE

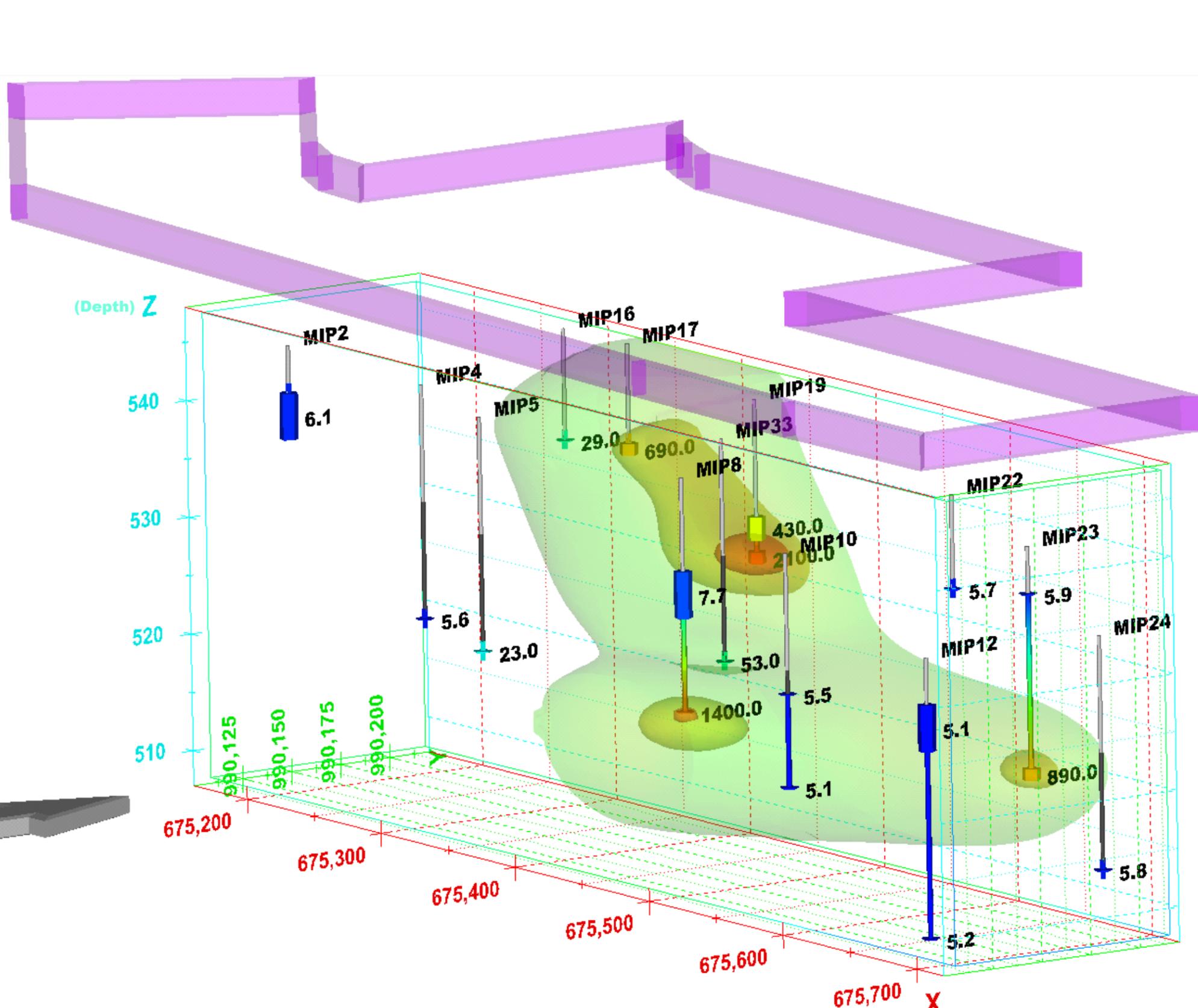
Source: Tetra Tech, Inc., Nov 2016

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

**Figure 8**  
 3D TCE Soil Subsurface Model  
 (E to W View)

**TETRA TECH**

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**Legend**

TCE Concentration (ppb)

2,100  
1,000  
300  
100  
30  
10  
3  
2

MIP Membrane interface probe  
ppb Parts per billion  
TCE Trichloroethene

**Notes:**

- No subsurface soil samples were collected at MIP survey locations 1, 3, 6, 7, 9, 11, 13-15, 18, 20, 21, 25-32, and 34-37; no quantitative data was generated.
- The information in the 3D model was generated by using the State Plane projection Missouri East 2401 Feet; Datum NAD1983.
- All the values given in the X, Y, Z planes are in feet; where X is the X coordinate in feet (longitude), Y is the Y coordinate in feet (latitude), and Z is the depth in feet below ground surface.

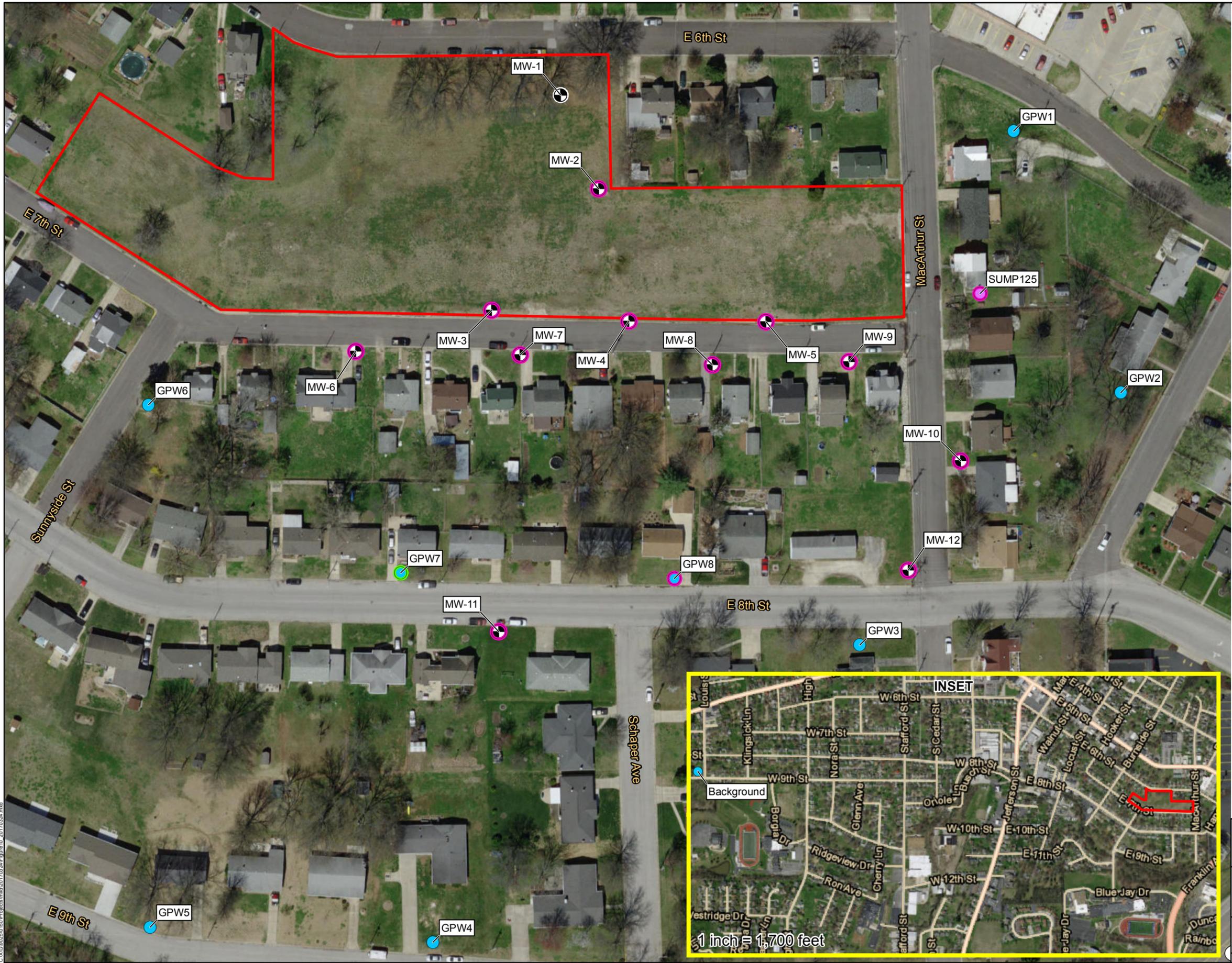
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Source: Tetra Tech, Inc., Nov 2016  
 Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

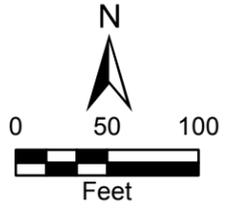
**Figure 9**  
 3D TCE Soil Subsurface Model  
 (General View)



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- Legend
- TCE Detected Below MCL
  - TCE Exceeding MCL
  - Geoprobe Temporary Well Location
  - Sump Water Well Location
  - ⊗ Existing Monitoring Well Location
  - ▬ Site Boundary
- GPW Geoprobe Well  
 MW Monitoring Well  
 MCL Maximum Contaminant Level  
 TCE Trichloroethene



Source: ESRI, Data Maps, World Imagery, 2015

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

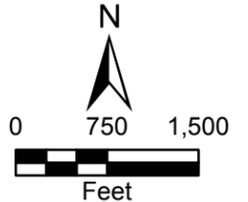
**Figure 10**  
 Groundwater Sampling Locations



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- Legend
-  Municipal Drinking Water Well Location
  -  1.3-Mile Buffer Boundary
  -  Site Boundary
- MUNW Municipal Water



Source: ESRI, Data Maps, World Imagery, 2015

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

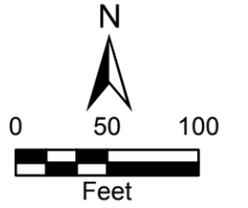
**Figure 11**  
 Municipal Drinking Water  
 Well Sampling Locations



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- Legend
- Shallow Soil Gas Location
  - ▬ Site Boundary
  - SSG Shallow Soil Gas



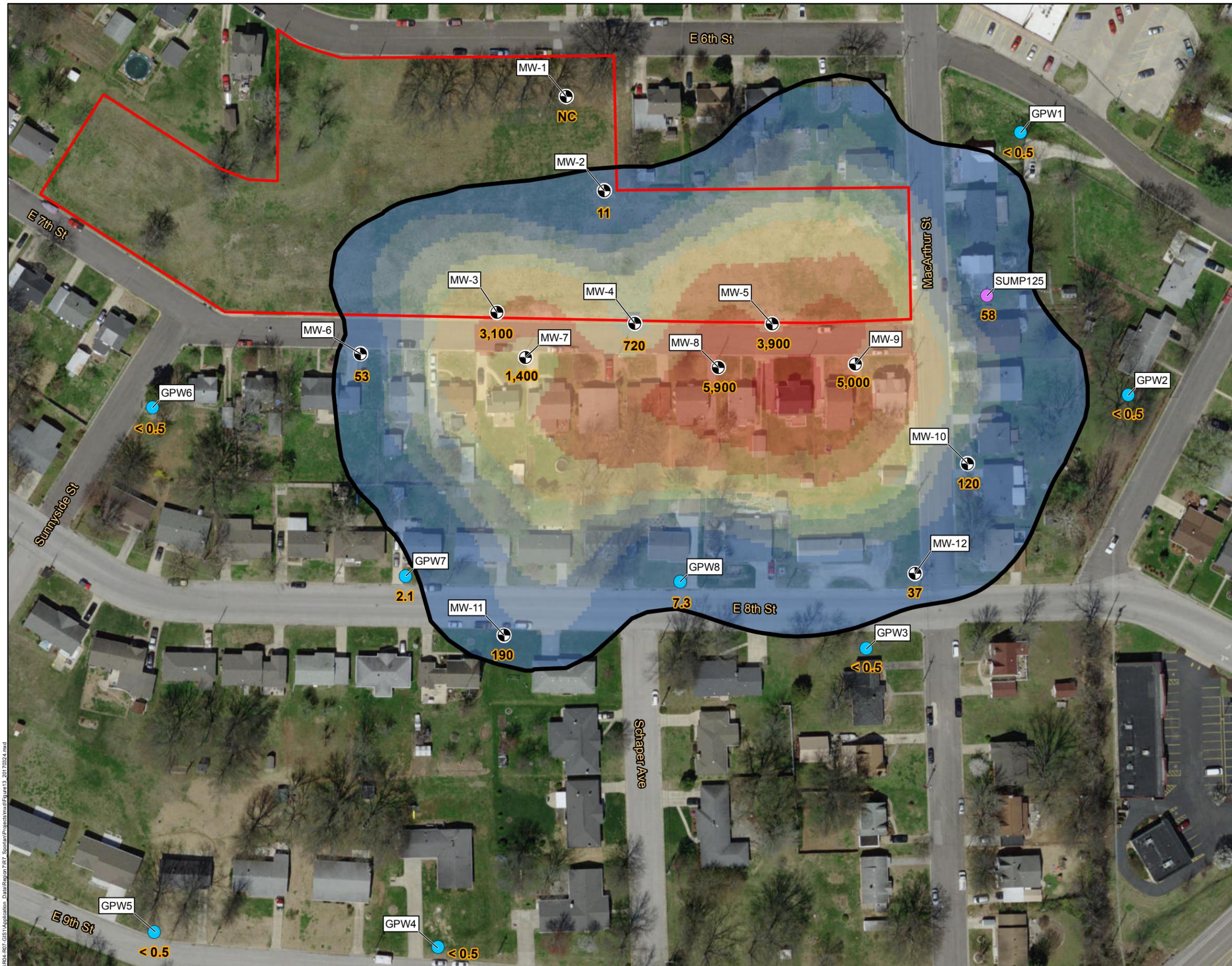
Source: ESRI, Data Maps, World Imagery, 2015

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri

**Figure 12**  
 Shallow Soil Gas Sampling Locations



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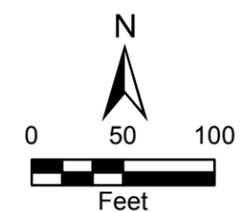
**Legend**

- ⊕ Existing Monitoring Well Location
- Geoprobe Temporary Well Location
- Sump Water Well Location
- ⊕ Approx. Groundwater Plume (Nov 2016)
- ⊕ Site Boundary

**TCE Concentration (ug/L)**

- 5 - 249.9
- 250 - 499.9
- 500 - 999.9
- 1,000 - 1,499.9
- 1,500 - 2,999.9
- 3,000 - 4,999.9
- 5,000 - 11,999.9
- 12,000 - 15,000

GPW Geoprobe Well  
 MW Monitoring Well  
 NC Not Collected  
 SUMP Sump Well  
 TCE Trichloroethene  
 ug/L Micrograms per Liter  
**1,400** TCE Concentration Result



Source: ESRI, Data Maps, World Imagery, 2015

Sporlan Valve Plant # 1 Site  
 611 East Seventh Street  
 Washington, Missouri  
**Figure 13**  
 Groundwater Plume for Trichloroethene  
 (November 2016)



I:\R04-R07-0151\Application - Data\Region7\ER SporlanProjects\mxd\Figure13\_20170324.mxd

**APPENDIX B**  
**PHOTOGRAPHIC LOG**

**Sporlan Valve Plant #1 Site  
Washington, Missouri**



<p>TETRA TECH PROJECT NO. X9025.16.0150.000</p> <p>DIRECTION: Southeast</p>	DESCRIPTION	This photograph shows the EPA Region 7 Geoprobe® and Membrane Interface Probe (MIP) apparatus. MIP control units are mounted in the all-terrain vehicle (ATV).	1
	CLIENT	Environmental Protection Agency - Region 7	DATE 10/25/16
	PHOTOGRAPHER	Laura Moore	



<p>TETRA TECH PROJECT NO. X9025.16.0150.000</p> <p>DIRECTION: East</p>	DESCRIPTION	This photograph shows an overview of the site property and MIP survey area, as seen from the west end of the survey area.	2
	CLIENT	Environmental Protection Agency - Region 7	DATE 10/25/16
	PHOTOGRAPHER	Laura Moore	

**Sporlan Valve Plant #1 Site  
Washington, Missouri**



TETRA TECH PROJECT NO. X9025.16.0150.000  DIRECTION: Northwest	DESCRIPTION	This photograph shows the MIP control modules mounted in the back of a Kawasaki Mule ATV.	3
	CLIENT	Environmental Protection Agency - Region 7	DATE
	PHOTOGRAPHER	Laura Moore	10/25/16



TETRA TECH PROJECT NO. X9025.16.0150.000  DIRECTION: East	DESCRIPTION	This photograph shows the southeast corner of the site property. MIP grid points are marked with survey flags. Monitoring well #3 (MW-3) is in the foreground.	4
	CLIENT	Environmental Protection Agency - Region 7	DATE
	PHOTOGRAPHER	Laura Moore	10/25/16

**Sporlan Valve Plant #1 Site  
Washington, Missouri**



<p>TETRA TECH PROJECT NO. X9025.16.0150.000</p> <p>DIRECTION: Northwest</p>	DESCRIPTION	This photograph shows the northwest corner of the site property and MIP survey area. Monitoring well #2 (MW-2) is in the foreground, next to the sewer manhole.	5
	CLIENT	Environmental Protection Agency - Region 7	DATE 10/25/16
	PHOTOGRAPHER	Laura Moore	



<p>TETRA TECH PROJECT NO. X9025.16.0150.000</p> <p>DIRECTION: Southeast</p>	DESCRIPTION	This photograph shows a Superfund Technical Assessment and Response Team (START) member installing a shallow soil gas sampling probe at a residence near the site.	6
	CLIENT	Environmental Protection Agency - Region 7	DATE 11/21/16
	PHOTOGRAPHER	Ann Marie Pohlman	

**Sporlan Valve Plant #1 Site  
Washington, Missouri**



TETRA TECH PROJECT NO. X9025.16.0150.000  DIRECTION: Northwest	DESCRIPTION	This photograph shows a START member purging a shallow soil gas sampling probe prior to sample collection at a residential property.	7
	CLIENT	Environmental Protection Agency - Region 7	DATE 11/21/16
	PHOTOGRAPHER	Ann Marie Pohlman	



TETRA TECH PROJECT NO. X9025.16.0150.000  DIRECTION: Southeast	DESCRIPTION	This photograph shows a START member collecting a shallow soil gas sample with a Summa canister at a residential property.	8
	CLIENT	Environmental Protection Agency - Region 7	DATE 11/21/16
	PHOTOGRAPHER	Ann Marie Pohlman	

**APPENDIX C**

**FIELD SHEETS AND CHAIN-OF-CUSTODY RECORDS**

ASR-7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print) Heath Smith, Dave Kinosh	NAME OF SURVEY OR ACTIVITY Spartan Valve Company	DATE OF COLLECTION 24 11 16 DAY MONTH YEAR	SHEET 1 of 1
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SAMPLE NUMBER	TYPE OF CONTAINERS				SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers etc.)	
	Can CONTAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	water	soil	sediment	dust		other
7257-1	1									Air	VOA Amb A.4G
-2	↓									↓	↓
-3	↓									↓	↓
-4	↓									↓	↓

END OF SHIPMENT  
6 more samples to follow for Summa  
canisters  
Dave Kinosh  
11-21-16

DESCRIPTION OF SHIPMENT 4 PIECE(S) CONSISTING OF 1 BOX(ES) ICE CHEST(S): OTHER	MODE OF SHIPMENT <input type="checkbox"/> COMMERCIAL CARRIER <input type="checkbox"/> COURIER <input type="checkbox"/> SAMPLER CONVEYED
--	--

Fedex  
7777 6749 339  
(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD			
RELINQUISHED BY (SAMPLER) Dave Kinosh	DATE 11-21-16	TIME 17:23	REASON FOR CHANGE OF CUSTODY Transport to Lab for analysis
<input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			
RELINQUISHED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			
RELINQUISHED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			

Sample Collection Field Sheet  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257 Sample Number: 1 QC Code: \_\_\_ Matrix: Air Tag ID: 7257-1-\_\_

Project ID: HSB7A800 Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition Site ID: B7A8 Site OU: 00

Location Desc: SVPI-SG-20161121-175-1

External Sample Number: \_\_\_\_\_

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High) Date \_\_\_\_\_ Time(24 hr) \_\_\_\_\_  
Latitude: \_\_\_\_\_ Sample Collection: Start: 11/24/16 11:56  
Longitude: \_\_\_\_\_ End: 11/24/16 12:11

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments:

(N/A)

Property ID 175 Soil Gas  
Canister # 3052 NE Quadrant of back yard  
Initial Vacuum Ending Vacuum  
-28.5 -1.5

Sample Collected By: START



**Sample Collection Field Sheet**  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257    Sample Number: 3    QC Code: \_\_\_    Matrix: Air    Tag ID: 7257-3-\_\_\_

Project ID: HSB7A800    Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington    State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition    Site ID: B7A8    Site OU: 00

Location Desc: SVPI-SG-20161121-158-1

External Sample Number: \_\_\_\_\_

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High)    Date \_\_\_\_\_    Time(24 hr) \_\_\_\_\_  
Latitude: \_\_\_\_\_    Sample Collection: Start: 11/21/16    15:06  
Longitude: \_\_\_\_\_    End: 11/21/16    15:10

**Laboratory Analyses:**

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

**Sample Comments:**

(N/A)

Property ID 158 Soil Gas

Canister # 10361

Initial Vacuum	Ending Vacuum
-28.0	-1.5

Sample Collected By: START

**Sample Collection Field Sheet**  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257    Sample Number: 4    QC Code: \_\_\_    Matrix: Air    Tag ID: 7257-4-\_\_\_

Project ID: HSB7A800    Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington    State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition    Site ID: B7A8    Site OU: 00

Location Desc: SUP-GE-2016121-121-1

External Sample Number: \_\_\_\_\_

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High)    Date \_\_\_\_\_    Time(24 hr) \_\_\_\_\_  
Latitude: \_\_\_\_\_    Sample Collection: Start: 11/21/16    15:45  
Longitude: \_\_\_\_\_    End: 11/21/16    15:53

**Laboratory Analyses:**

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

**Sample Comments:**

(N/A)

Property ID 121 Soil Gas

Canister # = L5206

Initial Vacuum  
-28.6

Ending Vacuum  
-1.5

Sample Collected By: START

ASR 7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER (Print) <i>Dave Kinosh, Heath Smith</i>	NAME OF SURVEY OR ACTIVITY <i>Spoken Valve Company</i>	DATE OF COLLECTION DAY: <i>29</i> MONTH: <i>11</i> YEAR: <i>16</i>	SHEET 1 of 1
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CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS			VOA SET (2 VIALS EA)	SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers etc.)
	<i>Summa</i> CONTAINER	BOTTLE	BOTTLE		water	soil	sediment	dust	other	
7257-5	1								<i>Air</i>	<i>VOA Amb A.46</i>
-6	↓									
-7	↓									
-8	↓									
-9	↓									
-10	↓									

*END OF Shallow Soil Gas  
Samples for this ASR -  
Only four drinking water VOA  
samples remain outstanding  
to complete this ASR  
in entirety.  
Dave Kinosh  
11-29-16*

DESCRIPTION OF SHIPMENT <i>6</i> PIECE(S) CONSISTING OF <i>1</i> BOX(ES) ICE CHEST(S): OTHER _____	MODE OF SHIPMENT <input checked="" type="checkbox"/> COMMERCIAL CARRIER <i>Fedex</i> <input type="checkbox"/> COURIER <input type="checkbox"/> SAMPLER CONVEYED <i>8606 7308 4506</i> (SHIPPING DOCUMENT NUMBER)
--	---

PERSONNEL CUSTODY RECORD			
RELINQUISHED BY (SAMPLER) <i>Dave Kinosh</i>	DATE <i>11-29-16</i>	TIME <i>18:30</i>	REASON FOR CHANGE OF CUSTODY <i>Transport to Lab for Analysis</i>
<input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			
RELINQUISHED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			
RELINQUISHED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			



Sample Collection Field Sheet  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257    Sample Number: 7    QC Code: \_\_\_    Matrix: Air    Tag ID: 7257-11-29-6 <sup>6 OK</sup>

Project ID: HSB7A800    Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company    State: Missouri  
City: Washington  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition    Site ID: B7A8    Site OU: 00

Location Desc: SVPI-SG-20161129-SSG-6

External Sample Number: \_\_\_\_\_

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High)    Date    Time(24 hr)  
Latitude: \_\_\_\_\_    Sample Collection: Start: 11/29/16    12:51  
Longitude: \_\_\_\_\_    End: 11/29/16    12:52

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments:

(N/A)

No Property ID - NE Corner of Sporlan  
Valve Company property along E 6th St  
Shallow Soil Gas  
Canister # L5112

Begin Vacuum  
-27.5

end vacuum  
- 1.5

Sample Collected By: START

Sample Collection Field Sheet  
US EPA Region 7  
Kansas City, KS

7 401  
11/1

ASR Number: 7257 Sample Number: 8 QC Code: \_\_\_ Matrix: Air Tag ID: 7257-8-\_\_\_

Project ID: HSB7A800 Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition Site ID: B7A8 Site OU: 00

Location Desc: SVPI-SG-20161129-SSG-7

External Sample Number: \_\_\_\_\_

Expected Conc: (or Circle One: Low Medium High) Date Time(24 hr)  
Latitude: \_\_\_\_\_ Sample Collection: Start: 11/29/16 13:58  
Longitude: \_\_\_\_\_ End: 11/29/16 14:02

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments:

(N/A)

Shallow Soil Gas 812 MacArthur  
Front yard = SSG-7

Canister # L5186  
Begin Vacuum -27.5  
and Vacuum -1.5

Sample Collected By: START

Sample Collection Field Sheet  
US EPA Region 7  
Kansas City, KS

8/24/16  
11-2

ASR Number: 7257 Sample Number: 9 QC Code: \_\_\_ Matrix: Air Tag ID: 7257-~~5~~-11-2

Project ID: HSB7A800 Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition Site ID: B7A8 Site OU: 00

Location Desc: SVPI-SG-20161129-SSG8  
External Sample Number: 206-1

Expected Conc: (or Circle One: Low Medium High) Date Time(24 hr)  
Latitude: \_\_\_\_\_ Sample Collection: Start: 11/29/16 14:43  
Longitude: \_\_\_\_\_ End: 11/29/16 14:46

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments:

(N/A)

Shallow Soil Gas 621 E 9th St,  
Frontyard = SSG8 ID 206

Canister # - L5200

Begin Vacuum  
-27.5

End Vacuum  
-1.5

Sample Collected By: START

**Sample Collection Field Sheet**  
 US EPA Region 7  
 Kansas City, KS

9 20K  
 11-29

ASR Number: 7257    Sample Number: 10    QC Code: \_\_\_    Matrix: Air    Tag ID: 7257-18-11-29

Project ID: HSB7A800    Project Manager: J. Heath Smith  
 Project Desc: Sporlan Valve Company  
 City: Washington    State: Missouri  
 Program: Superfund  
 Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition    Site ID: B7A8    Site OU: 00

Location Desc: SVPI-SG-20161129-SSG-9  
 External Sample Number: 191-1

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High)    Date: \_\_\_\_\_    Time(24 hr): \_\_\_\_\_  
 Latitude: \_\_\_\_\_    Sample Collection: Start: 11/29/16    15:47  
 Longitude: \_\_\_\_\_    End: 11/29/16    15:50

**Laboratory Analyses:**

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments: (N/A)    Shallow Soil Gas 803 Schaper  
 Backyard = SSG-9    ID 191  
 Canister # L5201

Begin Vacuum    End Vacuum  
 -27.5    -1.5

\* Notes: Upon completion of sample, valve was closed and when START tried to conduct final QA vacuum reading with a secondary gauge value appears to be stuck in closed position.

Sample Collected By: START

Sample Collection Field Sheet  
US EPA Region 7  
Kansas City, KS

10 ADX  
11-29

ASR Number: 7257 Sample Number: 5 QC Code: \_\_\_ Matrix: Air Tag ID: 7257-8-\_\_\_

Project ID: HSB7A800 Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition Site ID: B7A8 Site OU: 00

Location Desc: SVP1-SG-2016 11 29 - SSG-10  
External Sample Number: 171-1

Expected Conc: (or Circle One: Low Medium High) Date Time(24 hr)  
Latitude: \_\_\_\_\_ Sample Collection: Start: 11/29/16 16:27  
Longitude: \_\_\_\_\_ End: 11/29/16 16:30

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 6 Liter Canister	None	60 Days	1 VOCs in Air at Ambient Levels by GC/MS

Sample Comments:

(N/A)

Property ID 171 Shallow Soil Gas =  
SSG10  
Canister # L5207  
Begin Vacuum - 28.0  
Ending Vacuum - 1.5

Sample Collected By: START

ASR7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

31 10 16 to

ACTIVITY LEADER(Print) Heath Smith / Dave Kinroth	NAME OF SURVEY OR ACTIVITY Sporkon Valve Company	DATE OF COLLECTION DAY MONTH YEAR 1 11 16	SHEET 1 of 1
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CONTENTS OF SHIPMENT  
ISA

SAMPLE NUMBER	TYPE OF CONTAINERS				VOA SET (VIALS EA)	SAMPLED MEDIA				RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)	
	CUBITAINER	BOTTLE	BOTTLE	BOTTLE		water	soil	sediment	dust		other
7257-101					3		X				* 3x volume for MS/MSD Analysis LCL VOA's 516 E on all samples Specific Compounds only TCE, PCE, DCE compounds VC
-102					1						
-103											
-104											
-105											
-106											
-107											
-108											
-109											
-110											
-111											
-112											
-113											
-114											
-115											
-116											
-117											
-118											
-119											

End of Shipment #1 No more soil samples to follow  
on this ASR - waters and A/S yet to be  
submitted  
- Dave Kinroth 1-11-16

DESCRIPTION OF SHIPMENT: 21 PIECE(S) CONSISTING OF _____ BOX(ES) 1 ICE CHEST(S); OTHER _____	MODE OF SHIPMENT <input checked="" type="checkbox"/> COMMERCIAL CARRIER Fedex <input type="checkbox"/> COURIER <input type="checkbox"/> SAMPLER CONVEYED 777611510785 (SHIPPING DOCUMENT NUMBER)
--	---

PERSONNEL CUSTODY RECORD			
RELINQUISHED BY (SAMPLER) Dave Kinroth	DATE 11-1-16 11-1-16 2:00K	TIME 15:50	REASON FOR CHANGE OF CUSTODY
<input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			
RELINQUISHED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			
RELINQUISHED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			













**Sample Collection Field Sheet**  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257    Sample Number: 107    QC Code: \_\_\_    Matrix: Solid    Tag ID: 7257-107-\_\_\_

Project ID: HSB7A800    Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington    State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition    Site ID: B7A8    Site OU: 00

Location Desc: MTP @ 20 feet bgs

External Sample Number: \_\_\_\_\_

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High)    Date: \_\_\_\_\_    Time(24 hr): \_\_\_\_\_  
Latitude: \_\_\_\_\_    Sample Collection: Start: 10/31/16    15:36  
Longitude: \_\_\_\_\_    End:   /  /        :  

**Laboratory Analyses:**

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vials (soil VOA 5035)	4 Deg C, sodium bisulfate (2 vials), MeOH (1 vial)	14 Days	1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap
0 -	4 Deg C	0 Days	1 Percent Solid

**Sample Comments:**

(N/A)

Sample Collected By: START









**Sample Collection Field Sheet**  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257    Sample Number: 112    QC Code: \_\_\_    Matrix: Solid    Tag ID: 7257-112-\_\_\_

Project ID: HSB7A800    Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington    State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition    Site ID: B7A8    Site OU: 00

Location Desc: MIP 12 4-8 feet bgs

External Sample Number: \_\_\_\_\_

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High)    Date \_\_\_\_\_    Time(24 hr) \_\_\_\_\_  
Latitude: \_\_\_\_\_    Sample Collection: Start: 11/1/16    8:10  
Longitude: \_\_\_\_\_    End:   /  /        :  

**Laboratory Analyses:**

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vials (soil VOA 5035)	4 Deg C, sodium bisulfate (2 vials), MeOH (1 vial)	14 Days	1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap
0 -	4 Deg C	0 Days	1 Percent Solid

**Sample Comments:**

(N/A)

Sample Collected By: START















ASR 7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER (Print) Heath Smith, Dave Kinosh	NAME OF SURVEY OR ACTIVITY Spokane Valve Company	DATE OF COLLECTION 7 12 16 DAY MONTH YEAR	SHEET 1 of 1
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SAMPLE NUMBER	TYPE OF CONTAINERS					SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers etc.)
	CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET VIALS EA)	water	soil	sediment	slit	other	
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
7257-201					3	X					3X Volume for MS/MSI
-202					1						
-203					1						
-204FB					1						
<p>Final Sample Shipment for ASR 7257 - ASR is completed Dave Kinosh 12-7-16</p>											

DESCRIPTION OF SHIPMENT 6 PIECE(S) CONSISTING OF _____ BOX(ES) 1 ICE CHEST(S) OTHER _____	MODE OF SHIPMENT <input checked="" type="checkbox"/> COMMERCIAL CARRIER <u>Fedex</u> <input type="checkbox"/> COURIER <input type="checkbox"/> SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER)
---	---

PERSONNEL CUSTODY RECORD				
RELINQUISHED BY (SAMPLER) <u>Dave Kinosh</u>	DATE 12-7-16	TIME 12:36	RECEIVED BY	REASON FOR CHANGE OF CUSTODY Transport to Lab for Analysis
<input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	









ASR 7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print) <i>Heath Smith, Dave Kinosh</i>	NAME OF SURVEY OR ACTIVITY <i>Spartan Valley ISA</i>	DATE OF COLLECTION <i>23</i> DAY <i>11</i> MONTH <i>16</i> YEAR	SHEET <i>1</i> of <i>1</i>
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SAMPLE NUMBER	TYPE OF CONTAINERS				#VOA SET #VIALS EA)	SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers, etc.)
	CUBITAINER	BOTTLE	BOTTLE	BOTTLE		water	soil	sludges	sludge	other	
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
7257-301					1	X					LDL VOA W. 13E on MS/MSD Triplate
-302				*3							
-303											
-304											
-305											
-306											
<p><i>END SHIPMENT #1</i></p> <p><i>for LDL VOA water samples</i></p> <p><i>more to follow next week</i></p>											

DESCRIPTION OF SHIPMENT <i>R</i> PIECE(S) CONSISTING OF _____ BOX(ES) <i>L</i> ICE CHEST(S): OTHER _____	MODE OF SHIPMENT <input checked="" type="checkbox"/> COMMERCIAL CARRIER <i>FedEx</i> <input type="checkbox"/> COURIER <input type="checkbox"/> SAMPLER CONVEYED <i>8046 27560970</i> (SHIPPING DOCUMENT NUMBER)
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PERSONNEL CUSTODY RECORD				
RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
<i>Dave Kinosh</i>	<i>11-3-16</i>	<i>16:40</i>		<i>Transport to Lab for Analysis</i>
<input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED	









**Sample Collection Field Sheet**  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257    Sample Number: 305    QC Code: \_\_\_    Matrix: Water    Tag ID: 7257-305-\_\_\_

Project ID: HSB7A800    Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company  
City: Washington    State: Missouri  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition    Site ID: B7A8    Site OU: 00

Location Desc: Water LDL VOA sample

External Sample Number: \_\_\_\_\_

Expected Conc: \_\_\_\_\_ (or Circle One: Low Medium High)    Date: \_\_\_\_\_    Time(24 hr): \_\_\_\_\_  
Latitude: \_\_\_\_\_    Sample Collection: Start: 11/3/16    13:30  
Longitude: \_\_\_\_\_    End: \_\_\_/\_\_\_/\_\_\_    \_\_\_:\_\_\_

**Laboratory Analyses:**

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

**Sample Comments:**

(N/A)

GPW4 621 E 9th St, Groundwater  
(~~No Property ID assigned to this property yet.~~) ID 206  
Hole was 34 feet bgs with water collected at 14.5 feet bgs

Sample Collected By: START



ASR 7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print) <i>Heath Smith / Dave Kinosh</i>	NAME OF SURVEY OR ACTIVITY <i>Sparky Valve</i>	DATE OF COLLECTION DAY: <i>4</i> MONTH: <i>11</i> YEAR: <i>16</i>	SHEET of <i>1</i>
--	---	--	----------------------

SAMPLE NUMBER	TYPE OF CONTAINERS				VOA SET (VIALS EA)	SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers, etc.)
	CUBITAINER	BOTTLE	BOTTLE	BOTTLE		water	soil	sediment	dust	other	
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
<i>7257-307</i>					<i>3</i>	<i>X</i>					<i>3X Vol / MS / LDL VOA</i>
<i>-308FB</i>					<i>1</i>						<i>W. 135</i>
<i>-309</i>											
<i>-310</i>											
<i>-311</i>											
<i>-312</i>											
<i>END OF 2nd SHIPMENT of LDL VOA WATER SAMPLES — MORE TO COME — <del>Dave Kinosh</del></i>											

DESCRIPTION OF SHIPMENT <i>1</i> PIECE(S) CONSISTING OF _____ BOX(ES) ICE CHEST(S): OTHER _____	MODE OF SHIPMENT <input checked="" type="checkbox"/> COMMERCIAL CARRIER <input type="checkbox"/> COURIER <input type="checkbox"/> SAMPLER CONVEYED	<i>Fedex</i> <i>804627560960</i> (SHIPPING DOCUMENT NUMBER)
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PERSONNEL CUSTODY RECORD			
RELINQUISHED BY (SAMPLER) <i>Dave Kinosh</i>	DATE <i>11-7-16</i>	TIME <i>18:05</i>	RECEIVED BY
<input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED
REASON FOR CHANGE OF CUSTODY			
RELINQUISHED BY	DATE	TIME	RECEIVED BY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED
REASON FOR CHANGE OF CUSTODY			
RELINQUISHED BY	DATE	TIME	RECEIVED BY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED
REASON FOR CHANGE OF CUSTODY			

ASR 7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print) <i>Heath Smith / Dave Kinosh</i>	NAME OF SURVEY OR ACTIVITY <i>Sparkn Valve</i>	DATE OF COLLECTION DAY: <i>4</i> MONTH: <i>11</i> YEAR: <i>16</i>	SHEET of <i>1</i>
--	---	--	----------------------

SAMPLE NUMBER	TYPE OF CONTAINERS				VOA SET (VIALS EA)	SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers etc.)
	CUBITAINER	BOTTLE	BOTTLE	BOTTLE		water	soil	sediment	dust	other	
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
<i>7257-307</i>					<i>3</i>	<i>X</i>					<i>3X Vol / ITS / LDL VOA W. 135</i>
<i>-308FB</i>					<i>1</i>						
<i>-309</i>											
<i>-310</i>											
<i>-311</i>											
<i>-312</i>											
<i>END OF 2nd SHIPMENT of LDL VOA WATERS SAMPLES — MORE TO COME — <del>Dave Kinosh</del></i>											

DESCRIPTION OF SHIPMENT <i>1</i> PIECE(S) CONSISTING OF _____ BOX(ES) <i>1</i> ICE CHEST(S): OTHER _____	MODE OF SHIPMENT <input checked="" type="checkbox"/> COMMERCIAL CARRIER <input type="checkbox"/> COURIER <input type="checkbox"/> SAMPLER CONVEYED	<i>Fedex</i> <i>804627560960</i> (SHIPPING DOCUMENT NUMBER)
--	---	---

PERSONNEL CUSTODY RECORD			
RELINQUISHED BY (SAMPLER) <i>Dave Kinosh</i>	DATE <i>11-7-16</i>	TIME <i>18:05</i>	RECEIVED BY
<input checked="" type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED
RELINQUISHED BY	DATE	TIME	RECEIVED BY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED
RELINQUISHED BY	DATE	TIME	RECEIVED BY
<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED			<input type="checkbox"/> SEALED <input type="checkbox"/> UNSEALED













ASR 7257

CHAIN OF CUSTODY RECORD  
ENVIRONMENTAL PROTECTION AGENCY REGION VII

10/21/16

ACTIVITY LEADER(Print)

Heath Smith/Dave Knuth

NAME OF SURVEY OR ACTIVITY

Spokane Valve Company

DATE OF COLLECTION

16/10/16

SHEET

1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS				VOA SET (VIALS EA)	SAMPLED MEDIA					RECEIVING LABORATORY REMARKS OTHER INFORMATION (condition of samples upon receipt other sample numbers etc)
	CUBITAINER	BOTTLE	BOTTLE	BOTTLE		water	soil	sediment	dust	other	
7257-313					1	X					VOA LDLW:13E
-314					1						3X MS/MSD
-315					3						
-316					1						
-317											
-318											
-319											
-320											
-321											
-322											
-323											
-324FB											

END OF LDL VOA  
Water Samples - LDL  
Drinking Water Samples still  
to follow

DESCRIPTION OF SHIPMENT

14 PIECE(S) CONSISTING OF \_\_\_\_\_ BOX(ES)

1 ICE CHEST(S): OTHER \_\_\_\_\_

MODE OF SHIPMENT

X COMMERCIAL CARRIER Fedex

\_\_\_\_ COURIER

\_\_\_\_ SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)

DATE

TIME

RECEIVED BY

REASON FOR CHANGE OF CUSTODY

*Dave Knuth* 10-17-16 17:08

SEALED  UNSEALED

SEALED  UNSEALED

Transport to Lab for Analysis

RELINQUISHED BY

DATE

TIME

RECEIVED BY

REASON FOR CHANGE OF CUSTODY

SEALED  UNSEALED

SEALED  UNSEALED

REASON FOR CHANGE OF CUSTODY

RELINQUISHED BY

DATE

TIME

RECEIVED BY

REASON FOR CHANGE OF CUSTODY

SEALED  UNSEALED

SEALED  UNSEALED

REASON FOR CHANGE OF CUSTODY

RELINQUISHED BY

DATE

TIME

RECEIVED BY

REASON FOR CHANGE OF CUSTODY





















Sample Collection Field Sheet  
US EPA Region 7  
Kansas City, KS

ASR Number: 7257 Sample Number: 323 QC Code: \_\_\_ Matrix: Water Tag ID: 7257-323-\_\_\_

Project ID: HSB7A800 Project Manager: J. Heath Smith  
Project Desc: Sporlan Valve Company State: Missouri  
City: Washington  
Program: Superfund  
Site Name: SPORLAN VALVE COMPANY - Site Evaluation/Disposition Site ID: B7A8 Site OU: 00

Location Desc: Water LDL VOA sample

External Sample Number: \_\_\_\_\_

Expected Conc: (or Circle One: Low Medium High) Date Time(24 hr)  
Latitude: \_\_\_\_\_ Sample Collection: Start: 11/17/16 14:55  
Longitude: \_\_\_\_\_ End: 1/1/17 :\_

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

(N/A)

MW-12

Total depth TOC = 48.45 feet

Depth to water = 10.0 feet

water column = 38.45 feet

pH = 6.45

3X purge volume = 18.0 gals

Temp = 22.57°C

purged only 6.3 gallons 1 purge

Conductivity =  
1563  $\mu$ S/cm

volume and well quit producing  
let recharge  $\frac{1}{2}$  sample

Sample Collected By: START



**APPENDIX D**

**ANALYTICAL SUMMARY TABLES**

Table D-1: Subsurface Soil Samples Results Summary- Sporlan Valve Plant #1 Site, Washington, MO (Page 1 of 1)

Sampling Date 10/31/2016		Chemical Constituent Concentrations (µg/kg)									
Sample #	Location (ft bgs)	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-101	MIP2 (4-8)	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 18.1
7257-102	MIP4 (20)	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6	< 16.6
7257-103	MIP5 (20)	23	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 17.9
7257-104	MIP16 (9.5)	29	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1	< 18.1
7257-105	MIP17 (8.5-9.5)	690	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 15.0
7257-106	MIP8 (8-12)	7.7	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 5.9	< 17.9
7257-107	MIP8 (20)	1,400 J	< 5.5	< 5.5	< 5.5	32	17	< 5.5	< 5.5	< 5.5	< 16.5
7257-108	MIP10 (12)	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 16.5
7257-109	MIP10 (20)	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 15.1
7257-110	MIP19 (10-12)	430	< 5.3	38	71	1,500	580 J	9.7	< 5.3	< 5.3	< 16.3
7257-111	MIP19 (13-14)	2,100	< 56	94	210	2,500	150	< 56	< 56	76	< 166
Sampling Date 11/1/2016		Chemical Constituent Concentrations (µg/kg)									
7257-112	MIP12 (4-8)	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1	< 15.1
7257-113	MIP12 (24)	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2	< 15.2
7257-114	MIP23 (4)	< 5.9	< 5.9	< 5.9	< 5.9	150	44	< 5.9	< 5.9	< 5.9	< 17.9
7257-115	MIP23 (19-20)	890	< 5.5	15	5.9	3,900	740 J	< 5.5	< 5.5	< 5.5	10
7257-116	MIP22 (8)	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7	< 16.7
7257-117	MIP24 (20)	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8	< 17.8
7257-118	MIP33 (19)	53	< 6.0	< 6.0	< 6.0	6.4	< 6.0	< 6.0	< 6.0	< 6.0	< 18.0
7257-119	BKG	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6	< 19.6
SCDM Cancer Risk Screening Concentration		8,800	330,000	NE	NE	NE	94	12,000	NE	63,000	NE
RSL for Residential Soil (HQ=0.1)		410	8,100	23,000	160,000	16,000	59	1,200	490,000	5,800	58,000
		1,900	39,000	100,000	2,300,000	230,000	1,700	5,100	4,700,000	25,000	250,000

Notes:

Sample result in light blue-shaded cell exceeds either the RSL or SCDM screening level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

BKG = Offsite background sample

DCE = Dichloroethene

ft bgs = Feet below ground surface

J = Estimated value

MIP = Membrane interface probe

µg/kg = Micrograms per kilogram

NE = Not established

PCE = Tetrachloroethene, also known as perchloroethene

RSL = Regional Screening Level

SCDM = Superfund Chemical Data Matrix

TCE = Trichloroethene

VC = Vinyl chloride

Table D-2: Temporary Well and Sump Water Samples Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November 2016 (Page 1 of 2)

Property ID 120 - 604 MacArthur Street (GPW 1)											
Sampling Date 11/02/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-301	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID 125 - 608 MacArthur Street											
Sampling Date 11/02/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-302	Sump water	58	0.80	< 0.50	< 0.50	25	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID None - 603 Hancock Street (GPW 2)											
Sampling Date 11/02/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-303	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID 171 - 803 MacArthur Street (GPW 3)											
Sampling Date 11/03/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-304	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.68	< 0.50	< 0.50
Property ID 206 - 621 East 9th Street (GPW 4)											
Sampling Date 11/03/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-305	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID 203 - 615 East 9th Street (GPW 5)											
Sampling Date 11/03/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-306	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.55	< 0.50	< 0.50
SCDM Cancer Risk Screening Concentration		1.1	37	NE	NE	NE	0.021	1.4	NE	7.0	NE
GW Screening Level/MCL		5.0	5.0	7.0	100	70	2.0	5.0	1,000	700	10,000

Table D-2: Temporary Well and Sump Water Samples Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November 2016 (Page 2 of 2)

Property ID None - Geoprobe parts rinsate sample											
Sampling Date 11/04/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-307	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID None - Field Blank sample											
Sampling Date 11/04/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-308-FB	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID None - Background sample from City Lot at West 9th and Louis Streets											
Sampling Date 11/05/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-309	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID 158 - 600 East 7th Street (GPW 6)											
Sampling Date 11/07/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-310	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID 177 - 617 East 8th Street (GPW7)											
Sampling Date 11/07/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-311	Groundwater	2.1	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Property ID 181 - 625 East 8th Street (GPW 8)											
Sampling Date 11/07/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-312	Groundwater	7.3	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
SCDM Cancer Risk Screening Concentration		1.1	37	NE	NE	NE	0.021	1.4	NE	7.0	NE
GW Screening Level/MCL		5.0	5.0	7.0	100	70	2.0	5.0	1,000	700	10,000

Notes:

Sample result in light blue-shaded cell exceeds either the MCL or SCDM screening level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

DCE = Dichloroethene

GPW = Geoprobe water

MCL = Maximum Contaminant Level

µg/L = Micrograms per liter

NE = Not established

PCE = Tetrachloroethene, also known as perchloroethene

SCDM = Superfund Chemical Data Matrix

TCE = Trichloroethene

VC = Vinyl chloride

Table D-3: Monitoring Well Samples Results Summary- Sporlan Valve Plant #1 Site, Washington, MO November 2016 (Page 1 of 2)

Monitoring Well-1*											
Dry Well-Not Collected		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
NC	Groundwater	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Monitoring Well-2											
Sampling Date 11/16/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-313	Groundwater	11	< 0.50	< 0.50	< 0.50	3.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Monitoring Well-3											
Sampling Date 11/16/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-314	Groundwater	3,100	< 25	< 25	< 25	30	< 25	< 25	< 25	< 25	< 25
Monitoring Well-4											
Sampling Date 11/16/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-315	Groundwater	720	< 10	< 10	17	920	51	< 10	< 10	< 10	< 10
Monitoring Well-5											
Sampling Date 11/16/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-316	Groundwater	3,900	< 25	< 25	< 25	410	63	< 25	< 25	< 25	< 25
Monitoring Well-6											
Sampling Date 11/16/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-317	Groundwater	53	< 0.50	< 0.50	< 0.50	6.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
SCDM Cancer Risk Screening Concentration		1.1	37	NE	NE	NE	0.021	1.4	NE	7.0	NE
GW Screening Level/MCL		5.0	5.0	7.0	100	70	2.0	5.0	1,000	700	10,000

Table D-3: Monitoring Well Samples Results Summary- Sporlan Valve Plant #1 Site, Washington, MO November 2016 (Page 2 of 2)

Monitoring Well-7											
Sampling Date 11/16/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-318	Groundwater	1,400	< 13	< 13	< 13	28	< 13	< 13	< 13	< 13	< 13
Monitoring Well-8											
Sampling Date 11/16/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-319	Groundwater	5,900	< 50	150	< 50	1,700	1,100	< 50	< 50	< 50	< 50
Monitoring Well-9											
Sampling Date 11/17/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-320	Groundwater	5,000	< 50	< 50	< 50	290	< 50	< 50	< 50	< 50	< 50
Monitoring Well-10											
Sampling Date 11/17/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-321	Groundwater	120	< 1.0	< 1.0	< 1.0	8.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Monitoring Well-11											
Sampling Date 11/17/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-322	Groundwater	190	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Monitoring Well-12											
Sampling Date 11/17/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-323	Groundwater	37	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trip Blank Sample											
Sampling Date 11/17/2016		Chemical Constituent Concentrations (µg/L)									
Sample #	Location	TCE	PCE	1,1-DCE	trans- 1,2-DCE	cis- 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-324-FB	Groundwater	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
SCDM Cancer Risk Screening Concentration		1.1	37	NE	NE	NE	0.021	1.4	NE	7.0	NE
GW Screening Level/MCL		5.0	5.0	7.0	100	70	2.0	5.0	1,000	700	10,000

Notes:

\* MW-1 sample was not collected during this effort due to well being dry.

Sample result in light blue-shaded cell exceeds either the MCL or SCDM screening level.

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

DCE = Dichloroethene

MCL = Maximum Contaminant Level

µg/L = Micrograms per liter

NC = Not collected

NE = Not established

PCE = Tetrachloroethene, also known as perchloroethene

SCDM = Superfund Chemical Data Matrix

TCE = Trichloroethene

VC = Vinyl chloride

**Table D-4: Municipal Drinking Water Wells Samples Results Summary - Sporlan Valve Plant #1 Site, Washington, MO December 2016 (Page 1 of 1)**

<b>Municipal Well #4</b>											
<b>Sampling Date 12/07/2016</b>		<b>Chemical Constituent Concentrations (µg/L)</b>									
<b>Sample #</b>	<b>Location</b>	<b>TCE</b>	<b>PCE</b>	<b>1,1-DCE</b>	<b>trans- 1,2-DCE</b>	<b>cis- 1,2-DCE</b>	<b>VC</b>	<b>Benzene</b>	<b>Toluene</b>	<b>Ethylbenzene</b>	<b>Total Xylenes</b>
7257-201	Well #4	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50*	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
<b>Municipal Well #6</b>											
<b>Sampling Date 12/07/2016</b>		<b>Chemical Constituent Concentrations (µg/L)</b>									
<b>Sample #</b>	<b>Location</b>	<b>TCE</b>	<b>PCE</b>	<b>1,1-DCE</b>	<b>trans- 1,2-DCE</b>	<b>cis- 1,2-DCE</b>	<b>VC</b>	<b>Benzene</b>	<b>Toluene</b>	<b>Ethylbenzene</b>	<b>Total Xylenes</b>
7257-202	Well #6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
<b>Municipal Well #5</b>											
<b>Sampling Date 12/07/2016</b>		<b>Chemical Constituent Concentrations (µg/L)</b>									
<b>Sample #</b>	<b>Location</b>	<b>TCE</b>	<b>PCE</b>	<b>1,1-DCE</b>	<b>trans- 1,2-DCE</b>	<b>cis- 1,2-DCE</b>	<b>VC</b>	<b>Benzene</b>	<b>Toluene</b>	<b>Ethylbenzene</b>	<b>Total Xylenes</b>
7257-203	Well #5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
<b>Trip Blank</b>											
<b>Sampling Date 12/07/2016</b>		<b>Chemical Constituent Concentrations (µg/L)</b>									
<b>Sample #</b>	<b>Location</b>	<b>TCE</b>	<b>PCE</b>	<b>1,1-DCE</b>	<b>trans- 1,2-DCE</b>	<b>cis- 1,2-DCE</b>	<b>VC</b>	<b>Benzene</b>	<b>Toluene</b>	<b>Ethylbenzene</b>	<b>Total Xylenes</b>
7257-204-FB	Trip Blank	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
SCDM Cancer Risk Screening Concentration		1.1	37	NE	NE	NE	0.021	1.4	NE	7.0	NE
Screening Level/MCL		5.0	5.0	7.0	100	70	2.0	5.0	1,000	700	10,000

Notes:

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

\*=The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

DCE = Dichloroethene

MCL = Maximum Contaminant Level

µg/L = Micrograms per liter

NE = Not established

PCE = Tetrachloroethene, also known as perchloroethene

SCDM = Superfund Chemical Data Matrix

TCE = Trichloroethene

VC = Vinyl chloride

Table D-5: Shallow Soil Gas Samples Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November 2016 (Page 1 of 2)

Property ID 175 - 613 East 8th Street											
Sporlan Valve Plant #1 Site, Washington, MO											
Sampling Date 11/21/2016		Chemical Constituent Concentrations (µg/m <sup>3</sup> )									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-1	Shallow Soil Gas	< 1.72	< 1.64	< 7.92	< 7.92	< 7.92	< 0.64	< 1.24	48.2	19.3	163.3
Property ID None - 603 Hancock Street											
Sampling Date 11/21/2016		Chemical Constituent Concentrations (µg/m <sup>3</sup> )									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-2	Shallow Soil Gas	< 0.43	< 0.41	< 1.98	< 1.98	< 1.98	< 0.16	1.02	< 1.88	< 2.17	< 6.51
Property ID 158 - 600 East 7th Street											
Sampling Date 11/21/2016		Chemical Constituent Concentrations (µg/m <sup>3</sup> )									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-3	Shallow Soil Gas	< 0.43	< 0.41	< 1.98	< 1.98	< 1.98	< 0.16	0.766	< 1.88	< 2.17	< 6.51
Property ID 121 - 605 MacArthur Street											
Sampling Date 11/21/2016		Chemical Constituent Concentrations (µg/m <sup>3</sup> )									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-4	Shallow Soil Gas	< 0.43	< 0.41	< 1.98	< 1.98	< 1.98	< 0.16	0.575	< 1.88	< 2.17	< 6.51
Property ID None - Sporlan Valve Property-East 6th Street											
Sampling Date 11/29/2016		Chemical Constituent Concentrations (µg/m <sup>3</sup> )									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-5	Shallow Soil Gas	< 0.43	0.678	< 1.98	< 1.98	< 1.98	< 0.16	< 0.31	< 1.88	< 2.17	< 6.51
Property ID None - Sporlan Valve Property-East 6th Street											
Sampling Date 11/29/2016		Chemical Constituent Concentrations (µg/m <sup>3</sup> )									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-6	Shallow Soil Gas	1.93	0.678	< 1.98	< 1.98	< 1.98	< 0.16	0.383	< 1.88	< 2.17	< 6.51
Soil Gas Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3

Table D-5: Shallow Soil Gas Samples Results Summary - Sporlan Valve Plant #1 Site, Washington, MO November 2016 (Page 2 of 2)

Property ID None - 812 MacArthur Street											
Sampling Date 11/29/2016		Chemical Constituent Concentrations (µg/m³)									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-7	Shallow Soil Gas	< 0.43	< 0.41	< 1.98	< 1.98	< 1.98	< 0.16	1.09	< 1.88	< 2.17	< 6.51
Property ID 206 - 621 East 9th Street											
Sampling Date 11/29/2016		Chemical Constituent Concentrations (µg/m³)									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-8	Shallow Soil Gas	< 0.43	< 0.41	< 1.98	< 1.98	< 1.98	< 0.16	0.415	< 1.88	< 2.17	< 6.51
Property ID 191 - 803 Schaper Avenue											
Sampling Date 11/29/2016		Chemical Constituent Concentrations (µg/m³)									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-9	Shallow Soil Gas	< 0.43	< 0.41	< 1.98	< 1.98	< 1.98	< 0.16	0.511	< 1.88	< 2.17	< 6.51
Property ID 171 - 803 MacArthur Street											
Sampling Date 11/29/2016		Chemical Constituent Concentrations (µg/m³)									
Sample #	Location	TCE	PCE	1,1-DCE	<i>trans</i> - 1,2-DCE	<i>cis</i> - 1,2-DCE	VC	Benzene	Toluene	Ethylbenzene	Total Xylenes
7257-10	Shallow Soil Gas	< 0.43	< 0.41	< 1.98	< 1.98	< 1.98	< 0.16	0.734	< 1.88	< 2.17	< 6.51
Soil Gas Screening Level		6.7	140	700	NE	NE	5.7	12	17,333	36.7	333.3

Notes:

Sample result with "<" symbol indicates compound was not present above the minimum detection level (MDL) or non-detect (ND).

DCE = Dichloroethene

PCE = Tetrachloroethene, also known as perchloroethene

µg/m³ = Micrograms per cubic meter

TCE = Trichloroethene

NE = Not established

VC = Vinyl chloride

**APPENDIX E**  
**ANALYTICAL RESULTS**

**United States Environmental Protection Agency  
Region 7  
300 Minnesota Avenue  
Kansas City, KS 66101**

**Date:** 01/05/2017

**Subject:** Transmittal of Sample Analysis Results for ASR #: 7257

Project ID: HSB7A800

Project Description: Sporlan Valve Company

**From:** Margaret E.W. St. Germain, Chief  
Laboratory Technology & Analysis Branch, Environmental Sciences & Technology Division

**To:** J. Heath Smith  
SUPR/AERR/RRSS

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the Online ASR Sample/Data Disposition and Customer Survey for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Online ASR Sample/Data Disposition and Customer Survey.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

**Project Manager:** J. Heath Smith**Org:** SUPR/AERR/R  
RSS**Phone:** 636-326-4726**Project ID:** HSB7A800**Project Desc:** Sporlan Valve Company**Location:** Washington**State:** Missouri**Program:** Superfund**Site Name:** SPORLAN VALVE COMPANY - Site  
Evaluation/Disposition**Site ID:** B7A8 **Site OU:** 00**GPRA PRC:** 303DD2**Purpose:** Site Cleanup Support

Plant #1 site ISA sampling.

Per THankins' email dated 9/15/16: New work is in support of a removal assessment. PRC=303DC6 & this is not a brownfields site & cleared the 303DC6 with the EPA PM (HS).

Per THankins' email dated 10/6/16: Site is now 303DD2.

### Explanation of Codes, Units and Qualifiers used on this report

**Sample QC Codes:** QC Codes identify the type of sample for quality control purpose.

**Units:** Specific units in which results are reported.

\_\_\_ = Field Sample  
FB = Field Blank

% = Percent  
SU = Standard Units (pH)  
umhos/cm = Micromhos per Centimeter  
Deg C = Degrees Celsius  
ug/L = Micrograms per Liter  
ug/m3 = Micrograms per Cubic Meter  
ug/kg = Micrograms per Kilogram

**Data Qualifiers:** Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

J = The identification of the analyte is acceptable; the reported value is an estimate.

U = The analyte was not detected at or above the reporting limit.

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 - ___		Air	SVP1-SG-20161121-175-1		11/21/2016	11:56	11/21/2016	12:11	11/22/2016
2 - ___		Air	SVP1-SG-20161121-603 Hancock-1		11/21/2016	13:08	11/21/2016	13:44	11/22/2016
3 - ___		Air	SVP1-SG-20161121-158-1		11/21/2016	15:06	11/21/2016	15:10	11/22/2016
4 - ___		Air	SVP1-SG-20161121-121-1		11/21/2016	15:45	11/21/2016	15:53	11/22/2016
5 - ___		Air	SVP1-SG-20161129-SSG-5		11/29/2016	12:10	11/29/2016	12:11	11/30/2016
6 - ___		Air	SVP1-SG-20161129-SSG-6		11/29/2016	12:51	11/29/2016	12:52	11/30/2016
7 - ___		Air	SVP1-SG-20161129-SSG-7		11/29/2016	13:58	11/29/2016	14:02	11/30/2016
8 - ___		Air	SVP1-SG-20161129-206-1		11/29/2016	14:43	11/29/2016	14:46	11/30/2016
9 - ___		Air	SVP1-SG-20161129-191-1		11/29/2016	15:47	11/29/2016	15:50	11/30/2016
10 - ___		Air	SVP1-SG-20161129-171-1		11/29/2016	16:27	11/29/2016	16:30	11/30/2016
101 - ___		Solid	MIP2 4 to 8 feet bgs		10/31/2016	12:10			11/02/2016
102 - ___		Solid	MIP4 20 Feet bgs		10/31/2016	13:10			11/02/2016
103 - ___		Solid	MIP5 20 Feet bgs		10/31/2016	13:33			11/02/2016
104 - ___		Solid	MIP16 9.5 feet bgs		10/31/2016	14:45			11/02/2016
105 - ___		Solid	MIP17 8.5-9.5 bgs		10/31/2016	14:58			11/02/2016
106 - ___		Solid	MIP8 8-12 ft bgs		10/31/2016	15:11			11/02/2016
107 - ___		Solid	MIP8 20 feet bgs		10/31/2016	15:36			11/02/2016
108 - ___		Solid	MIP10 12 feet bgs		10/31/2016	16:08			11/02/2016
109 - ___		Solid	MIP10 20 feet bgs		10/31/2016	16:36			11/02/2016
110 - ___		Solid	MIP19 10-12 feet bgs		10/31/2016	17:15			11/02/2016
111 - ___		Solid	MIP19 13-14 feet bgs		10/31/2016	17:28			11/02/2016
112 - ___		Solid	MIP12 4-8 feet bgs		11/01/2016	08:10			11/02/2016
113 - ___		Solid	MIP12 24 feet bgs		11/01/2016	09:03			11/02/2016
114 - ___		Solid	MIP23 4 feet bgs		11/01/2016	09:22			11/02/2016
115 - ___		Solid	MIP23 19-20 feet bgs		11/01/2016	10:05			11/02/2016
116 - ___		Solid	MIP22 8 feet bgs		11/01/2016	10:18			11/02/2016
117 - ___		Solid	MIP24 20 feet bgs		11/01/2016	11:03			11/02/2016
118 - ___		Solid	MIP33 19 feet bgs		11/01/2016	11:45			11/02/2016
119 - ___		Solid	background soil municipal well 5 lot		11/01/2016	12:40			11/02/2016
201 - ___		Water	Municipal well #4		12/07/2016	10:50			12/08/2016
202 - ___		Water	Municipal well #6		12/07/2016	11:05			12/08/2016
203 - ___		Water	Municipal well #5		12/07/2016	11:21			12/08/2016
204 - FB		Water	Trip Blank		12/07/2016	12:24			12/08/2016
301 - ___		Water	GPW1 = ID 120 (29.8')		11/02/2016	12:32			11/04/2016
302 - ___		Water	ID 125 Sump Water		11/02/2016	10:48			11/04/2016
303 - ___		Water	GPW2 = 603 Hancock (30')		11/02/2016	16:45			11/04/2016
304 - ___		Water	GPW3 = ID 171 (40')		11/03/2016	08:55			11/04/2016
305 - ___		Water	GPW4 = ID 206 (34')		11/03/2016	13:30			11/04/2016
306 - ___		Water	GPW5 = ID 203 (16')		11/03/2016	14:15			11/04/2016
307 - ___		Water	Geoprobe parts Rinsate sample		11/04/2016	13:12			11/09/2016
308 - FB		Water	Field Blank sample		11/04/2016	13:30			11/09/2016
309 - ___		Water	GPW Background sample from City Lot at W 9th & Louis Streets (9')		11/05/2016	10:00			11/09/2016

ASR Number: 7257

Sample Information Summary

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
310 -	___	Water	GPW6 = ID 158 (19')		11/07/2016	11:42			11/09/2016
311 -	___	Water	GPW7 = ID 177 (19')		11/07/2016	12:06			11/09/2016
312 -	___	Water	GPW8 = ID 181 (34.6')		11/07/2016	12:40			11/09/2016
313 -	___	Water	MW-2		11/16/2016	08:43			11/18/2016
314 -	___	Water	MW-3		11/16/2016	10:06			11/18/2016
315 -	___	Water	MW-4		11/16/2016	11:29			11/18/2016
316 -	___	Water	MW-5		11/16/2016	13:15			11/18/2016
317 -	___	Water	MW-6		11/16/2016	14:58			11/18/2016
318 -	___	Water	MW-7		11/16/2016	14:58			11/18/2016
319 -	___	Water	MW-8		11/16/2016	17:25			11/18/2016
320 -	___	Water	MW-9		11/17/2016	09:38			11/18/2016
321 -	___	Water	MW-10		11/17/2016	10:50			11/18/2016
322 -	___	Water	MW-11		11/17/2016	12:34			11/18/2016
323 -	___	Water	MW-12		11/17/2016	14:55			11/18/2016
324 -	FB	Water	LDL VOA Trip Blank sample		11/17/2016	14:12			11/18/2016

**Analysis      Comments About Results For This Analysis**

1    VOCs in Air Samples in Canisters at Ambient Levels by GC/MS

**Lab:** RASP Contract Lab (Out-Source)

**Method:** Similar to EPA Region 7 RLAB Method 3230.4H (see comments)

**Samples:** 1-\_\_      2-\_\_      3-\_\_      4-\_\_      5-\_\_      6-\_\_      7-\_\_  
                 8-\_\_      9-\_\_      10-\_\_

**Comments:**

1    Percent Solid

**Lab:** Region 7 EPA Laboratory - Kansas City, Ks.

**Method:** EPA Region 7 RLAB Method 3142.9H

**Basis:** N/A

**Samples:** 101-\_\_    102-\_\_    103-\_\_    104-\_\_    105-\_\_    106-\_\_    107-\_\_  
                 108-\_\_    109-\_\_    110-\_\_    111-\_\_    112-\_\_    113-\_\_    114-\_\_  
                 115-\_\_    116-\_\_    117-\_\_    118-\_\_    119-\_\_

**Comments:**

(N/A)

1    VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap

**Lab:** Region 7 EPA Laboratory - Kansas City, Ks.

**Method:** EPA Region 7 RLAB Method 3230.16E

**Basis:** Dry

**Samples:** 101-\_\_    102-\_\_    103-\_\_    104-\_\_    105-\_\_    106-\_\_    107-\_\_  
                 108-\_\_    109-\_\_    110-\_\_    111-\_\_    112-\_\_    113-\_\_    114-\_\_  
                 115-\_\_    116-\_\_    117-\_\_    118-\_\_    119-\_\_

**Comments:**

All reporting limits are adjusted for sample size and percent moisture.

Sample 107 had a strong odor of hydrocarbons. In order to avoid damaging the instrument, this sample was analyzed at a 1/10 dilution (using the methanol preserved vial), so all reporting limits are increased by a factor of 10 in this sample.

Vinyl Chloride was J-coded in samples 110 and 115, and Trichloroethene was J-coded in sample 107. Although the analytes in question have been positively identified in the samples, the quantitations are estimates (J-coded) due to the reported values exceeding the calibrated range of the instrument. (Dilutions were performed from the Methanol preserved vials for these samples. However, the diluted values were far lower than the values obtained from the closed-loop analyses, indicating that the analytes were lost in the headspace of the vial. The values were reported from the closed-loop analyses because they were deemed to be far more accurate.)

**Analysis      Comments About Results For This Analysis**

1    Conductivity by Field Measurement

**Lab:** (Field Measurement)

**Method:** Measurement of field parameter

**Samples:** 313-\_\_ 314-\_\_ 315-\_\_ 316-\_\_ 319-\_\_ 320-\_\_ 321-\_\_  
                  322-\_\_ 323-\_\_

**Comments:**  
(N/A)

1    pH of Water by Field Measurement

**Lab:** (Field Measurement)

**Method:** Measurement of field parameter

**Samples:** 313-\_\_ 314-\_\_ 315-\_\_ 316-\_\_ 319-\_\_ 320-\_\_ 321-\_\_  
                  322-\_\_ 323-\_\_

**Comments:**  
(N/A)

1    Temperature of Water by Field Measurement

**Lab:** (Field Measurement)

**Method:** Measurement of field parameter

**Samples:** 313-\_\_ 314-\_\_ 315-\_\_ 316-\_\_ 319-\_\_ 320-\_\_ 321-\_\_  
                  322-\_\_ 323-\_\_

**Comments:**  
(N/A)

1    VOCs in Drinking Water by GC/MS

**Lab:** Contract Lab Program (Out-Source)

**Method:** CLP Statement of Work

**Samples:** 201-\_\_ 202-\_\_ 203-\_\_ 204-FB

**Comments:**

1,1-Dichloroethene was UJ-coded in sample -201. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to poor precision obtained for this analyte in the laboratory matrix spike and matrix spike duplicate. The actual reporting limit for this analyte may be higher than the reported value.

1    VOCs in Water by GC/MS for Low Detection Limits

**Lab:** Contract Lab Program (Out-Source)

**Method:** CLP Statement of Work

**Samples:** 301-\_\_ 302-\_\_ 303-\_\_ 304-\_\_ 305-\_\_ 306-\_\_ 307-\_\_

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**Analysis      Comments About Results For This Analysis**

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**Samples:** 308-FB    309-\_\_    310-\_\_    311-\_\_    312-\_\_    313-\_\_    314-\_\_  
                 315-\_\_    316-\_\_    317-\_\_    318-\_\_    319-\_\_    320-\_\_    321-\_\_  
                 322-\_\_    323-\_\_    324-FB

**Comments:**

Samples -314 and -316 were diluted 1:50; sample -315 was diluted 1:20; sample -318 was diluted 1:25; samples -319 and -320 were diluted 1:100; and samples -321 and -322 were diluted 1:2 prior to analysis due to high levels of target compounds. Therefore, the reporting limits for sample -314 and -316 were raised by a factor of 50; the reporting limits of sample -315 was raised by a factor of 20; the reporting limits of sample -318 were raised by a factor of 25; the reporting limits of samples -319 and -320 were raised by a factor of 100; and the reporting limits of samples -321 and -322 were raised by a factor of 2.

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	1.24 U	1.02	0.766	0.575
1,1-Dichloroethene	ug/m3	7.92 U	1.98 U	1.98 U	1.98 U
cis-1,2-Dichloroethene	ug/m3	7.92 U	1.98 U	1.98 U	1.98 U
trans-1,2-Dichloroethene	ug/m3	7.92 U	1.98 U	1.98 U	1.98 U
Ethyl Benzene	ug/m3	19.3	2.17 U	2.17 U	2.17 U
Tetrachloroethene	ug/m3	1.64 U	0.41 U	0.41 U	0.41 U
Toluene	ug/m3	48.2	1.88 U	1.88 U	1.88 U
Trichloroethene	ug/m3	1.72 U	0.43 U	0.43 U	0.43 U
Vinyl Chloride	ug/m3	0.64 U	0.16 U	0.16 U	0.16 U
m and/or p-Xylene	ug/m3	136	4.34 U	4.34 U	4.34 U
o-Xylene	ug/m3	27.3	2.17 U	2.17 U	2.17 U

**ASR Number:** 7257

**RLAB Approved Sample Analysis Results**

**01/05/2017**

**Project ID:** HSB7A800

**Project Desc:** Sporlan Valve Company

<b>Analysis/ Analyte</b>	<b>Units</b>	<b>5-__</b>	<b>6-__</b>	<b>7-__</b>	<b>8-__</b>
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.31 U	0.383	1.09	0.415
1,1-Dichloroethene	ug/m3	1.98 U	1.98 U	1.98 U	1.98 U
cis-1,2-Dichloroethene	ug/m3	1.98 U	1.98 U	1.98 U	1.98 U
trans-1,2-Dichloroethene	ug/m3	1.98 U	1.98 U	1.98 U	1.98 U
Ethyl Benzene	ug/m3	2.17 U	2.17 U	2.17 U	2.17 U
Tetrachloroethene	ug/m3	0.678	0.678	0.41 U	0.41 U
Toluene	ug/m3	1.88 U	1.88 U	1.88 U	1.88 U
Trichloroethene	ug/m3	0.43 U	1.93	0.43 U	0.43 U
Vinyl Chloride	ug/m3	0.16 U	0.16 U	0.16 U	0.16 U
m and/or p-Xylene	ug/m3	4.34 U	4.34 U	4.34 U	4.34 U
o-Xylene	ug/m3	2.17 U	2.17 U	2.17 U	2.17 U

Analysis/ Analyte	Units	9-__	10-__	101-__	102-__
1 VOCs in Air Samples in Canisters at Ambient Levels by GC/MS					
Benzene	ug/m3	0.511	0.734		
1,1-Dichloroethene	ug/m3	1.98 U	1.98 U		
cis-1,2-Dichloroethene	ug/m3	1.98 U	1.98 U		
trans-1,2-Dichloroethene	ug/m3	1.98 U	1.98 U		
Ethyl Benzene	ug/m3	2.17 U	2.17 U		
Tetrachloroethene	ug/m3	0.41 U	0.41 U		
Toluene	ug/m3	1.88 U	1.88 U		
Trichloroethene	ug/m3	0.43 U	0.43 U		
Vinyl Chloride	ug/m3	0.16 U	0.16 U		
m and/or p-Xylene	ug/m3	4.34 U	4.34 U		
o-Xylene	ug/m3	2.17 U	2.17 U		
1 Percent Solid					
Solids, percent	%			82.0	81.0
1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap					
Benzene	ug/kg			6.1 U	5.6 U
1,1-Dichloroethene	ug/kg			6.1 U	5.6 U
cis-1,2-Dichloroethene	ug/kg			6.1 U	5.6 U
trans-1,2-Dichloroethene	ug/kg			6.1 U	5.6 U
Ethyl Benzene	ug/kg			6.1 U	5.6 U
Tetrachloroethene	ug/kg			6.1 U	5.6 U
Toluene	ug/kg			6.1 U	5.6 U
Trichloroethene	ug/kg			6.1 U	5.6 U
Vinyl Chloride	ug/kg			6.1 U	5.6 U
m and/or p-Xylene	ug/kg			12 U	11 U
o-Xylene	ug/kg			6.1 U	5.6 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	103-__	104-__	105-__	106-__
1 Percent Solid					
Solids, percent	%	80.3	81.6	80.0	79.9
1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap					
Benzene	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U
1,1-Dichloroethene	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U
cis-1,2-Dichloroethene	ug/kg	5.9 U	6.1 U	37	5.9 U
trans-1,2-Dichloroethene	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U
Ethyl Benzene	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U
Tetrachloroethene	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U
Toluene	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U
Trichloroethene	ug/kg	23	29	690	7.7
Vinyl Chloride	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U
m and/or p-Xylene	ug/kg	12 U	12 U	10 U	12 U
o-Xylene	ug/kg	5.9 U	6.1 U	5.0 U	5.9 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	107-__	108-__	109-__	110-__
1 Percent Solid					
Solids, percent	%	82.0	80.1	82.3	80.7
1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap					
Benzene	ug/kg	5.5 U	5.5 U	5.1 U	9.7
1,1-Dichloroethene	ug/kg	5.5 U	5.5 U	5.1 U	38
cis-1,2-Dichloroethene	ug/kg	32	5.5 U	5.1 U	1500
trans-1,2-Dichloroethene	ug/kg	5.5 U	5.5 U	5.1 U	71
Ethyl Benzene	ug/kg	5.5 U	5.5 U	5.1 U	5.3 U
Tetrachloroethene	ug/kg	5.5 U	5.5 U	5.1 U	5.3 U
Toluene	ug/kg	5.5 U	5.5 U	5.1 U	5.3 U
Trichloroethene	ug/kg	1400 J	5.5 U	5.1 U	430
Vinyl Chloride	ug/kg	17	5.5 U	5.1 U	580 J
m and/or p-Xylene	ug/kg	11 U	11 U	10 U	11 U
o-Xylene	ug/kg	5.5 U	5.5 U	5.1 U	5.3 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	111-__	112-__	113-__	114-__
1 Percent Solid					
Solids, percent	%	82.9	82.8	80.7	79.9
1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap					
Benzene	ug/kg	56 U	5.1 U	5.2 U	5.9 U
1,1-Dichloroethene	ug/kg	94	5.1 U	5.2 U	5.9 U
cis-1,2-Dichloroethene	ug/kg	2500	5.1 U	5.2 U	150
trans-1,2-Dichloroethene	ug/kg	210	5.1 U	5.2 U	5.9 U
Ethyl Benzene	ug/kg	76	5.1 U	5.2 U	5.9 U
Tetrachloroethene	ug/kg	56 U	5.1 U	5.2 U	5.9 U
Toluene	ug/kg	56 U	5.1 U	5.2 U	5.9 U
Trichloroethene	ug/kg	2100	5.1 U	5.2 U	5.9 U
Vinyl Chloride	ug/kg	150	5.1 U	5.2 U	44
m and/or p-Xylene	ug/kg	110 U	10 U	10 U	12 U
o-Xylene	ug/kg	56 U	5.1 U	5.2 U	5.9 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	115-__	116-__	117-__	118-__
1 Percent Solid					
Solids, percent	%	81.2	80.3	81.6	80.3
1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap					
Benzene	ug/kg	5.5 U	5.7 U	5.8 U	6.0 U
1,1-Dichloroethene	ug/kg	15	5.7 U	5.8 U	6.0 U
cis-1,2-Dichloroethene	ug/kg	3900	5.7 U	5.8 U	6.4
trans-1,2-Dichloroethene	ug/kg	5.9	5.7 U	5.8 U	6.0 U
Ethyl Benzene	ug/kg	5.5 U	5.7 U	5.8 U	6.0 U
Tetrachloroethene	ug/kg	5.5 U	5.7 U	5.8 U	6.0 U
Toluene	ug/kg	5.5 U	5.7 U	5.8 U	6.0 U
Trichloroethene	ug/kg	890	5.7 U	5.8 U	53
Vinyl Chloride	ug/kg	740 J	5.7 U	5.8 U	6.0 U
m and/or p-Xylene	ug/kg	11 U	11 U	12 U	12 U
o-Xylene	ug/kg	10	5.7 U	5.8 U	6.0 U

Analysis/ Analyte	Units	119-__	201-__	202-__	203-__
1 Percent Solid					
Solids, percent	%	74.1			
1 VOC's in Soil at Low Levels by GC/MS Closed-System Purge-and-Trap					
Benzene	ug/kg	6.6 U			
1,1-Dichloroethene	ug/kg	6.6 U			
cis-1,2-Dichloroethene	ug/kg	6.6 U			
trans-1,2-Dichloroethene	ug/kg	6.6 U			
Ethyl Benzene	ug/kg	6.6 U			
Tetrachloroethene	ug/kg	6.6 U			
Toluene	ug/kg	6.6 U			
Trichloroethene	ug/kg	6.6 U			
Vinyl Chloride	ug/kg	6.6 U			
m and/or p-Xylene	ug/kg	13 U			
o-Xylene	ug/kg	6.6 U			
1 VOCs in Drinking Water by GC/MS					
Benzene	ug/L		0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	ug/L		0.50 UJ	0.50 U	0.50 U
cis-1,2-Dichloroethene	ug/L		0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	ug/L		0.50 U	0.50 U	0.50 U
Ethyl Benzene	ug/L		0.50 U	0.50 U	0.50 U
Tetrachloroethene	ug/L		0.50 U	0.50 U	0.50 U
Toluene	ug/L		0.50 U	0.50 U	0.50 U
Trichloroethene	ug/L		0.50 U	0.50 U	0.50 U
Vinyl Chloride	ug/L		0.50 U	0.50 U	0.50 U
m and/or p-Xylene	ug/L		0.50 U	0.50 U	0.50 U
o-Xylene	ug/L		0.50 U	0.50 U	0.50 U

Analysis/ Analyte	Units	204-FB	301-__	302-__	303-__
1 VOCs in Drinking Water by GC/MS					
Benzene	ug/L	0.50 U			
1,1-Dichloroethene	ug/L	0.50 U			
cis-1,2-Dichloroethene	ug/L	0.50 U			
trans-1,2-Dichloroethene	ug/L	0.50 U			
Ethyl Benzene	ug/L	0.50 U			
Tetrachloroethene	ug/L	0.50 U			
Toluene	ug/L	0.50 U			
Trichloroethene	ug/L	0.50 U			
Vinyl Chloride	ug/L	0.50 U			
m and/or p-Xylene	ug/L	0.50 U			
o-Xylene	ug/L	0.50 U			
1 VOCs in Water by GC/MS for Low Detection Limits					
Benzene	ug/L		0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	ug/L		0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	ug/L		0.50 U	25	0.50 U
trans-1,2-Dichloroethene	ug/L		0.50 U	0.50 U	0.50 U
Ethyl Benzene	ug/L		0.50 U	0.50 U	0.50 U
Tetrachloroethene	ug/L		0.50 U	0.80	0.50 U
Toluene	ug/L		0.50 U	0.50 U	0.50 U
Trichloroethene	ug/L		0.50 U	58	0.50 U
Vinyl Chloride	ug/L		0.50 U	0.50 U	0.50 U
m and/or p-Xylene	ug/L		0.50 U	0.50 U	0.50 U
o-Xylene	ug/L		0.50 U	0.50 U	0.50 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	304-__	305-__	306-__	307-__
1 VOCs in Water by GC/MS for Low Detection Limits					
Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Ethyl Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	ug/L	0.68	0.50 U	0.55	0.50 U
Trichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
m and/or p-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	308-FB	309-__	310-__	311-__
1 VOCs in Water by GC/MS for Low Detection Limits					
Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Ethyl Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Tetrachloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	ug/L	0.50 U	0.50 U	0.50 U	2.1
Vinyl Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
m and/or p-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	312-__	313-__	314-__	315-__
1 Conductivity by Field Measurement					
Conductivity	umhos/cm		1062	1234	1480
1 pH of Water by Field Measurement					
pH	SU		6.12	5.74	7.05
1 Temperature of Water by Field Measurement					
Temperature	Deg C		12.2	16.95	18.7
1 VOCs in Water by GC/MS for Low Detection Limits					
Benzene	ug/L	0.50 U	0.50 U	25 U	10 U
1,1-Dichloroethene	ug/L	0.50 U	0.50 U	25 U	10 U
cis-1,2-Dichloroethene	ug/L	0.50 U	3.0	30	920
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	25 U	17
Ethyl Benzene	ug/L	0.50 U	0.50 U	25 U	10 U
Tetrachloroethene	ug/L	0.50 U	0.50 U	25 U	10 U
Toluene	ug/L	0.50 U	0.50 U	25 U	10 U
Trichloroethene	ug/L	7.3	11	3100	720
Vinyl Chloride	ug/L	0.50 U	0.50 U	25 U	51
m and/or p-Xylene	ug/L	0.50 U	0.50 U	25 U	10 U
o-Xylene	ug/L	0.50 U	0.50 U	25 U	10 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	316-__	317-__	318-__	319-__
1 Conductivity by Field Measurement					
Conductivity	umhos/cm	1058			1758
1 pH of Water by Field Measurement					
pH	SU	6.92			6.88
1 Temperature of Water by Field Measurement					
Temperature	Deg C	19.28			16.97
1 VOCs in Water by GC/MS for Low Detection Limits					
Benzene	ug/L	25 U	0.50 U	13 U	50 U
1,1-Dichloroethene	ug/L	25 U	0.50 U	13 U	150
cis-1,2-Dichloroethene	ug/L	410	6.5	28	1700
trans-1,2-Dichloroethene	ug/L	25 U	0.50 U	13 U	50 U
Ethyl Benzene	ug/L	25 U	0.50 U	13 U	50 U
Tetrachloroethene	ug/L	25 U	0.50 U	13 U	50 U
Toluene	ug/L	25 U	0.50 U	13 U	50 U
Trichloroethene	ug/L	3900	53	1400	5900
Vinyl Chloride	ug/L	63	0.50 U	13 U	1100
m and/or p-Xylene	ug/L	25 U	0.50 U	13 U	50 U
o-Xylene	ug/L	25 U	0.50 U	13 U	50 U

ASR Number: 7257

RLAB Approved Sample Analysis Results

01/05/2017

Project ID: HSB7A800

Project Desc: Sporlan Valve Company

Analysis/ Analyte	Units	320-__	321-__	322-__	323-__
1 Conductivity by Field Measurement					
Conductivity	umhos/cm	1472	1152	1244	1563
1 pH of Water by Field Measurement					
pH	SU	7.08	7.64	6.24	6.45
1 Temperature of Water by Field Measurement					
Temperature	Deg C	16.7	20.47	18.49	22.07
1 VOCs in Water by GC/MS for Low Detection Limits					
Benzene	ug/L	50 U	1.0 U	1.0 U	0.50 U
1,1-Dichloroethene	ug/L	50 U	1.0 U	1.0 U	0.50 U
cis-1,2-Dichloroethene	ug/L	290	8.1	1.2	0.50 U
trans-1,2-Dichloroethene	ug/L	50 U	1.0 U	1.0 U	0.50 U
Ethyl Benzene	ug/L	50 U	1.0 U	1.0 U	0.50 U
Tetrachloroethene	ug/L	50 U	1.0 U	1.0 U	0.50 U
Toluene	ug/L	50 U	1.0 U	1.0 U	0.50 U
Trichloroethene	ug/L	5000	120	190	37
Vinyl Chloride	ug/L	50 U	1.0 U	1.0 U	0.50 U
m and/or p-Xylene	ug/L	50 U	1.0 U	1.0 U	0.50 U
o-Xylene	ug/L	50 U	1.0 U	1.0 U	0.50 U

**ASR Number:** 7257

**RLAB Approved Sample Analysis Results**

**01/05/2017**

**Project ID:** HSB7A800

**Project Desc:** Sporlan Valve Company

<b>Analysis/ Analyte</b>	<b>Units</b>	<b>324-FB</b>
1 VOCs in Water by GC/MS for Low Detection Limits		
Benzene	ug/L	0.50 U
1,1-Dichloroethene	ug/L	0.50 U
cis-1,2-Dichloroethene	ug/L	0.50 U
trans-1,2-Dichloroethene	ug/L	0.50 U
Ethyl Benzene	ug/L	0.50 U
Tetrachloroethene	ug/L	0.50 U
Toluene	ug/L	0.50 U
Trichloroethene	ug/L	0.50 U
Vinyl Chloride	ug/L	0.50 U
m and/or p-Xylene	ug/L	0.50 U
o-Xylene	ug/L	0.50 U