LMS/PIN/N02238

Pinellas County, Florida, Site Environmental Restoration Project

Semiannual Progress Report for the 4.5 Acre Site

December 2017 through May 2018

June 2018

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Abbreviations

amsl	above mean sea level
cDCE	*cis*-1,2-dichloroethene
COPCs	contaminants of potential concern
CTLs	cleanup target levels
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FAC	*Florida Administrative Code*
FDEP	Florida Department of Environmental Protection
µg/L	micrograms per liter
mg/L	milligrams per liter
RPD	relative percent difference
STAR Center	Young - Rainey Science, Technology, and Research Center
TCE	trichloroethene
tDCE	*trans*-1,2-dichloroethene
VC	vinyl chloride
VOCs	volatile organic compounds

Executive Summary

The 4.5 Acre Site was originally part of the Pinellas Plant, a former U.S. Department of Energy (DOE)-owned facility now known as the Young - Rainey Science, Technology, and Research (STAR) Center, where weapons research, development, and production was conducted until 1995. The 4.5 Acre Site, specifically, was owned by DOE from 1957 until their mission was completed there in 1972 with the sale of the property to a private landowner. Groundwater at the site was impacted by chlorinated solvents as a result of onsite activities during DOE operations. The contaminant source was removed through numerous aggressive remedial actions conducted by DOE since 1985, including a focused soil excavation by large-diameter auger in 2009 under a 2001 Comprehensive Environmental Response, Compensation, and Liability Act Remediation Agreement between DOE and the Florida Department of Environmental Protection.

Subsequent to the 2009 soil excavation, DOE performed three bioinjection events at the site in February 2010, July 2013, and October–December 2016. The purpose of the bioinjection events was to reduce the mass of dissolved-phase contaminants remaining in groundwater downgradient from the former source areas. These events consisted of injecting emulsified vegetable oil and the microorganism *Dehalococcoides mccartyi* into the subsurface to enhance naturally occurring biological degradation of the solvents. The result of these actions has been a significant reduction of contaminant concentrations in the closure monitoring wells, strongly indicating that the contaminant plume is shrinking. The only remaining contaminant that exceeds its cleanup target level (CTL) is vinyl chloride (VC).

- In September 2016, VC was detected above its CTL in three wells (20-M001, 20-M015, and 20-M059).
- In September 2017, data from two of these wells (20-M001 and 20-M059) were rejected due to oil impacts from the latest bioinjection, and the VC concentration in the third well (20-M015) was below the CTL.
- In March 2018, only one well (20-M069) contained VC (11 micrograms per liter [µg/L]) above the onsite CTL of 10 µg/L. The six wells along the west fenceline contained no VC. One well (20-M001) still could not be sampled due to oil impacts.

It is anticipated that VC will continue to degrade, and concentrations will remain non-detect or continue to decline in the closure monitoring wells.

With concurrence from the Florida Department of Environmental Protection (FDEP), the performance monitoring sampling frequency at the 4.5 Acre Site will be increased to quarterly beginning in June 2018. Performance monitoring will continue on a quarterly basis until four monitoring events have been completed to obtain the data necessary to close the site (unconditionally or conditionally) under the State of Florida's risk-based corrective action rules. Planned development construction activities at the site could dictate that the sampling frequency be increased again (such as monthly). DOE will obtain approval from FDEP before initiating another change.

1.0 Introduction

This *Pinellas County, Florida, Site Environmental Restoration Project Semiannual Progress Report for the 4.5 Acre Site* describes environmental restoration activities for the 4.5 Acre Site in Pinellas County, Largo, Florida (Figure 1). The former U.S. Department of Energy (DOE) Pinellas Plant facility consisted of the 4.5 Acre Site and what is now the Young - Rainey Science, Technology, and Research (STAR) Center. Both the 4.5 Acre Site and the STAR Center are part of the overall Pinellas County, Florida, Site (Figure 2).

The 4.5 Acre Site is located immediately northwest of the STAR Center, in the northeast quarter of Section 13, Township 30 South, Range 15 East. DOE owned this parcel from 1957 to 1972, at which time it was sold to a private landowner. During the period of DOE ownership, the property was used for the disposal of drums of waste resins and solvents. As a result of this practice, the surficial aquifer was impacted by volatile organic compounds (VOCs)—trichloroethene (TCE), *cis*-1,2-dichloroethene (cDCE), *trans*-1,2-dichloroethene (tDCE), vinyl chloride (VC), and benzene.

Detailed background information for the site is contained in the *Long-Term Surveillance and Maintenance Plan for the Pinellas Site* (DOE 2017).

Recent remediation activities consist of the injection of emulsified vegetable oil and the microorganism *Dehalococcoides mccartyi* into the subsurface to enhance contaminant biodegradation (also called bioinjection). Bioinjection events were conducted at the 4.5 Acre Site in February 2010, July 2013, and October through December 2016. The goal of bioinjection is to decrease contaminant concentrations to below cleanup target levels (CTLs). Evaluating the results of these actions, in the form of monitoring well sampling, is ongoing.

1.1 Site Activities

The following work took place during the December 2017–May 2018 period:

- Semiannual sampling was conducted; it consisted of collecting groundwater samples for VOC analysis from 10 monitoring wells on March 1, 2018, and measuring water levels in all accessible wells on February 28, 2018. One monitoring well (20-M001) was not sampled because it was still heavily impacted by bioinjection activities.
- Results of the semiannual monitoring are reported (in this document).

2.0 Monitoring Data

2.1 Groundwater Elevations and Flow

During this reporting period, depth-to-water measurements were taken in all accessible monitoring wells at the 4.5 Acre Site on February 28, 2018. The depth to water in each well was measured with an electronic water-level indicator. The groundwater elevation data, measured in feet above mean sea level (amsl), are listed in Table 1. Surface-water elevations for the West Pond (to the east) and Pond 5 (to the southeast) are listed in Table 2. Water-elevation data were

used to construct contours of water levels in the shallow and deep portions of the surficial aquifer (Figures 3 and 4).

For the past several years, groundwater flow patterns in both the shallow and deep surficial aquifers indicate radial flow from the center of the site, with flow to the northwest in the northern part of the site and to the west-southwest on the west side of the site. These patterns were observed slightly in the deep surficial aquifer in March 2018 (Figure 4), as the potentiometric surface was observed to be flatter than usual, with a relief of less than 0.4 foot. There is typically also a component of flow toward the south or southeast in the southern part of the site, and this pattern was interpreted in both the shallow and deep portions of the surficial aquifer (Figures 3 and 4).

The hydraulic gradient was approximately 0.0006 foot per foot across the central part of the site. This gradient is an order of magnitude lower than typical values at the site. Calculations using Darcy's law, along with approximations of 1 foot per day for hydraulic conductivity and 0.3 for effective porosity, indicate that groundwater at the site is estimated to move less than 1 foot per year. Groundwater velocities at the site have historically ranged from 2 to 10 feet per year.

2.2 Groundwater Sampling

During the semiannual monitoring event in March 2018, groundwater samples for VOC analysis were collected from 10 of the 11 routine monitoring wells. Results are discussed in Section 3.0. Well 20-M001 was not sampled because this well was highly impacted by injected vegetable oil, and the sample would therefore not be representative of groundwater at that well. In the purge water at impacted locations, the oil appears as a milky fluid when fresh or as a cloudy, dark fluid when weathered.

All samples were collected in accordance with the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351), using Florida Department of Environmental Protection (FDEP) procedures. All monitoring wells were micropurged using high-density polyethylene tubing or dedicated Teflon tubing and a peristaltic pump. Samples were collected when field measurements stabilized.

Table 3 lists the March 2018 field measurements of turbidity recorded at the time the samples were collected. Turbidity measurements were made using a nephelometer. A full set of field parameters (pH, specific conductance, temperature, oxidation-reduction potential, and dissolved oxygen) could not be measured in any of the wells due to interference from the injected vegetable oil. For these wells, samples were collected when water-level, turbidity, and purge-volume criteria were met. The laboratory results for the 10 sampled wells were checked for quality assurance/quality control and the analytical data are acceptable as qualified (see Section 2.4)

All samples were submitted to TestAmerica Laboratories in Denver, Colorado, for analysis. TestAmerica Denver is accredited by the Florida Department of Health in accordance with the National Environmental Laboratory Accreditation Conference (certification number E87667). VOCs were analyzed using U.S. Environmental Protection Agency (EPA) SW-846 method 8260B.

2.3 Groundwater Analytical Results

While older site documents have compared groundwater contaminant concentrations to drinking water standards, those standards are not the applicable default CTLs for evaluating site remediation under the State of Florida risk-based corrective action regulations. On the basis of a comprehensive review of background data for the site (DOE 2003), it was determined that the shallow groundwater in the site vicinity is naturally elevated in aluminum and iron at levels far exceeding Florida's "Drinking Water Standards, Monitoring, and Reporting" (Chapter 62-550 *Florida Administrative Code* [FAC]). Specifically, the average background concentration of 1.1 milligrams per liter (mg/L) for aluminum exceeds the 0.2 mg/L secondary standard, and the average background concentration for iron of 9.3 mg/L exceeds the 0.3 mg/L secondary standard. The ambient shallow groundwater in the area is therefore designated as "poor quality" as defined in 62-780.200(35) FAC. Thus, the applicable groundwater CTLs are those for groundwater of "low yield/poor quality" provided in Table 1 of Chapter 62-777 FAC (i.e., onsite CTLs are a factor of 10 higher than offsite CTLs). FAC rules stipulate use of the CTLs for poor water quality on source property and maintain that default CTLs apply offsite.

A total of 10 water samples from the site were submitted for laboratory analysis following the March 2018 sampling event. Well 20-M001 was not sampled due to oil impact in the well. Table 4 presents concentrations for individual contaminants of potential concern (COPCs) in samples collected from the 11 routine monitoring wells since September 2014. The COPCs for the 4.5 Acre Site are TCE, cDCE, tDCE, VC, and benzene. The only well to have a COPC that exceeded its CTL in March 2018 was 20-M069, which had a VC concentration of 11 micrograms per liter (µg/L); the (onsite) CTL is 10 µg/L. Figure 5 shows the VC concentrations for March 2018. The laboratory report for samples collected in March 2018 is provided in Appendix A. Interpretation of the laboratory data is presented in Section 3.0.

2.4 Quality Assurance/Quality Control

The results from TestAmerica were checked for quality assurance/quality control through field and laboratory duplicate samples, trip blanks, and equipment blanks. In addition, a data-validation software module for identifying and tracking anomalous groundwater data was used to generate a report of analytical results that fall outside of historical minimum or maximum values. The data from the 10 sampled monitoring wells are acceptable as qualified.

As specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*, field duplicate samples should be collected at a frequency of 1 duplicate for every 20 or fewer samples. During the March 2018 event, 10 samples were collected and 2 duplicate samples were collected, so this criterion was met. For wells that that were duplicated, the duplicate results were compared to the corresponding well results, and the relative percent differences (RPDs) were calculated (Table 5). All duplicate results met the EPA-recommended criteria, demonstrating acceptable overall precision for all analytes.

3.0 Data Interpretation and Performance Monitoring

Trend plots for the 11 routine monitoring wells are shown as Figures 6–16. As mentioned in Section 2.3, only one well had a COPC exceed its CTL in March 2018 (11 µg/L VC in

well 20-M069). Since September 2014, the only compound that has exceeded its CTL at the 4.5 Acre Site is VC; therefore, only VC is shown on these plots. These trend plots, along with the VC concentration map (Figure 5), show that the latest remediation efforts (bioinjections) are effectively reducing the remaining contaminant concentrations and shrinking the groundwater plume.

- Well 20-M001 (Figure 6) was not sampled in March 2017 or March 2018 due to impacts from the bioinjections. It was sampled in September 2017, but the analytical data were rejected during the data validation process due to interference from the injected oil. The most recent VC result for well 20-M001 is 19 µg/L in September 2016.
- Well 20-M015 (Figure 7) has had three consecutive events without a VC detection. The last VC detection in this well occurred in September 2016 (25 µg/L).
- Well 20-M053 (Figure 8) has had two consecutive events without a VC detection (this well was not sampled in March 2017 due to oil impacts). The last VC detection in this well occurred in September 2016 (2.1 µg/L).
- Well 20-M056 (Figure 9) has not had a VC CTL exceedance dating back to September 2014.
- Well 20-M057 (Figure 10) was non-detect for VC in March 2018. This is the first time a sample could be collected from this well since September 2016, when the VC concentration was 3.2 µg/L.
- Well 20-M058 (Figure 11) has had three consecutive events without a VC detection. The last VC detection in this well occurred in September 2016 (2.0 µg/L).
- Well 20-M059 (Figure 12) was not sampled in March 2017 due to impacts from the bioinjections. It was sampled in September 2017, but the analytical data were rejected during the data validation process due to interference from the injected oil. The most recent VC detection from well 20-M059 was 49 µg/L in September 2016. VC was not detected in this well in March 2018.
- Well 20-M067 (Figure 13) has not had a VC CTL exceedance dating back to September 2014.
- Well 20-M068 (Figure 14) contained VC at <1 µg/L in March 2018. This well has not had a VC CTL exceedance since September 2015.
- Well 20-M069 (Figure 15) is the only well to have a VC exceedance in March 2018 (11 µg/L). This well had been most recently sampled in September 2017, when it had a VC concentration of 3.6 µg/L. As shown on Figure 1, the VC concentration at 20-M069 has bounced above and below the onsite CTL of 10 µg/L several times in the past few years.
- Well 20-M18D (Figure 16) has not had a VC CTL exceedance dating back to September 2014.

With concurrence from FDEP, the performance monitoring sampling frequency at the 4.5 Acre Site will be increased to quarterly beginning in June 2018. The 11 onsite monitoring wells will be sampled, but the six monitoring wells along the CSX railroad tracks will not be sampled as long as COPC concentrations from the six onsite monitoring wells along the west fenceline remain below their respective offsite CTLs using FDEP's rounding rule. The sampling frequency is being increased to allow collection of four rounds of data prior to construction activities

planned by the new site owner. If the construction schedule dictates that the sampling frequency needs to be increased again (such as monthly) to meet this goal, DOE will request approval from FDEP at that time.

4.0 Upcoming Tasks

The following tasks are planned for June through November 2018:

- The first quarterly sampling event will take place in June 2018.
- Annual well inspections will be performed in August 2018.
- The next semiannual sampling event (second quarterly sampling event) will be conducted in September 2018.

5.0 References

DOE (U.S. Department of Energy), 2003. Y*oung - Rainey STAR Center, Pinellas Environmental Restoration Project, Historical Review and Evaluation of Contaminants of Potential Concern*, GJO-2002-359-TAC, February.

DOE (U.S. Department of Energy), 2017. *Long-Term Surveillance and Maintenance Plan for the Pinellas Site*, LMS/PIN/N01058, Office of Legacy Management, September.

FAC 62-550. "Drinking Water Standards, Monitoring, and Reporting," *Florida Administrative Code*.

FAC 62-777. "Contaminant Cleanup Target Levels," *Florida Administrative Code*.

FAC 62-780. "Contaminated Site Cleanup Criteria," *Florida Administrative Code*.

Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites, LMS/PRO/S04351, continually updated, prepared by Navarro Research and Engineering, Inc., for the U.S. Department of Energy Office of Legacy Management.

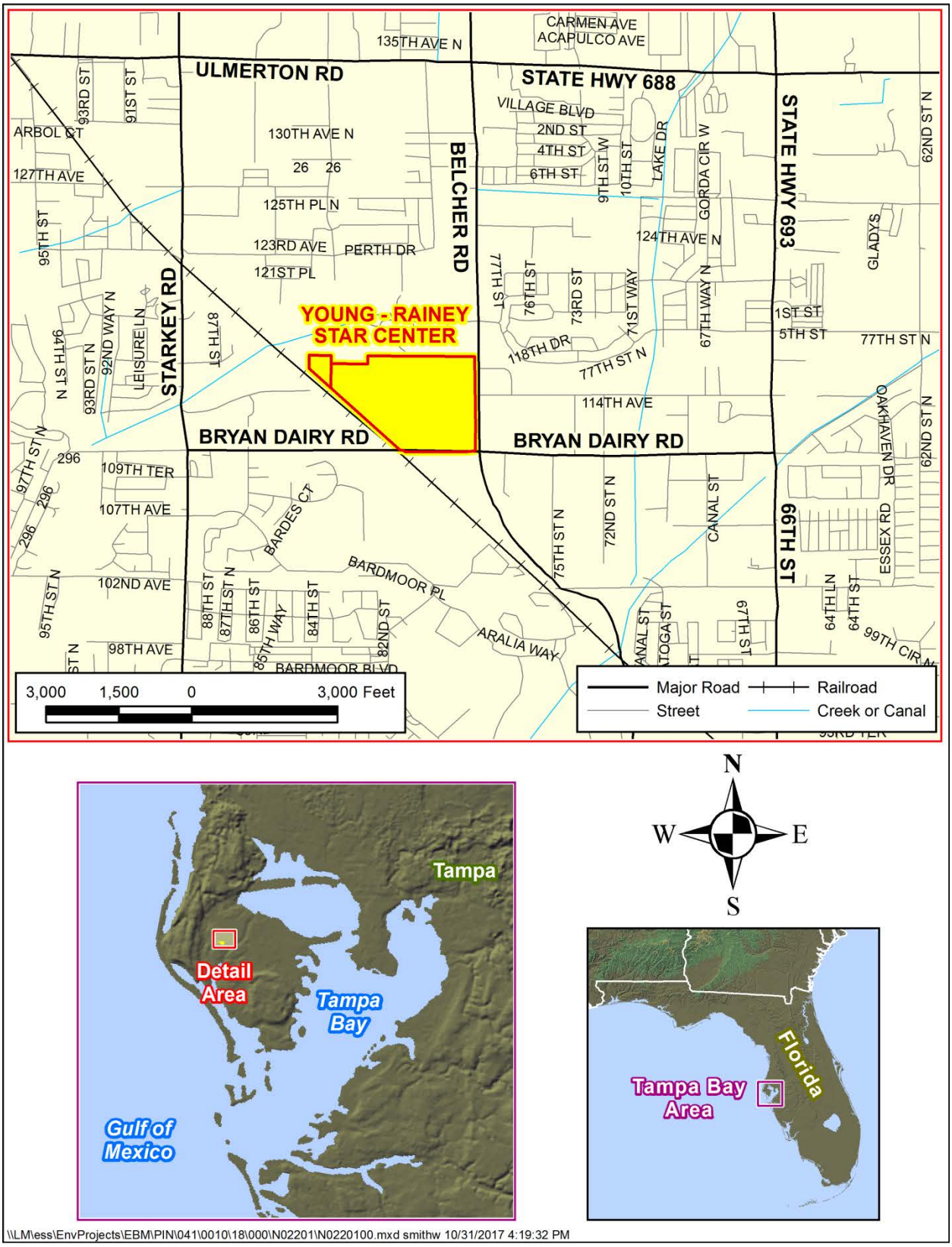

Figure 1. Young - Rainey STAR Center Location

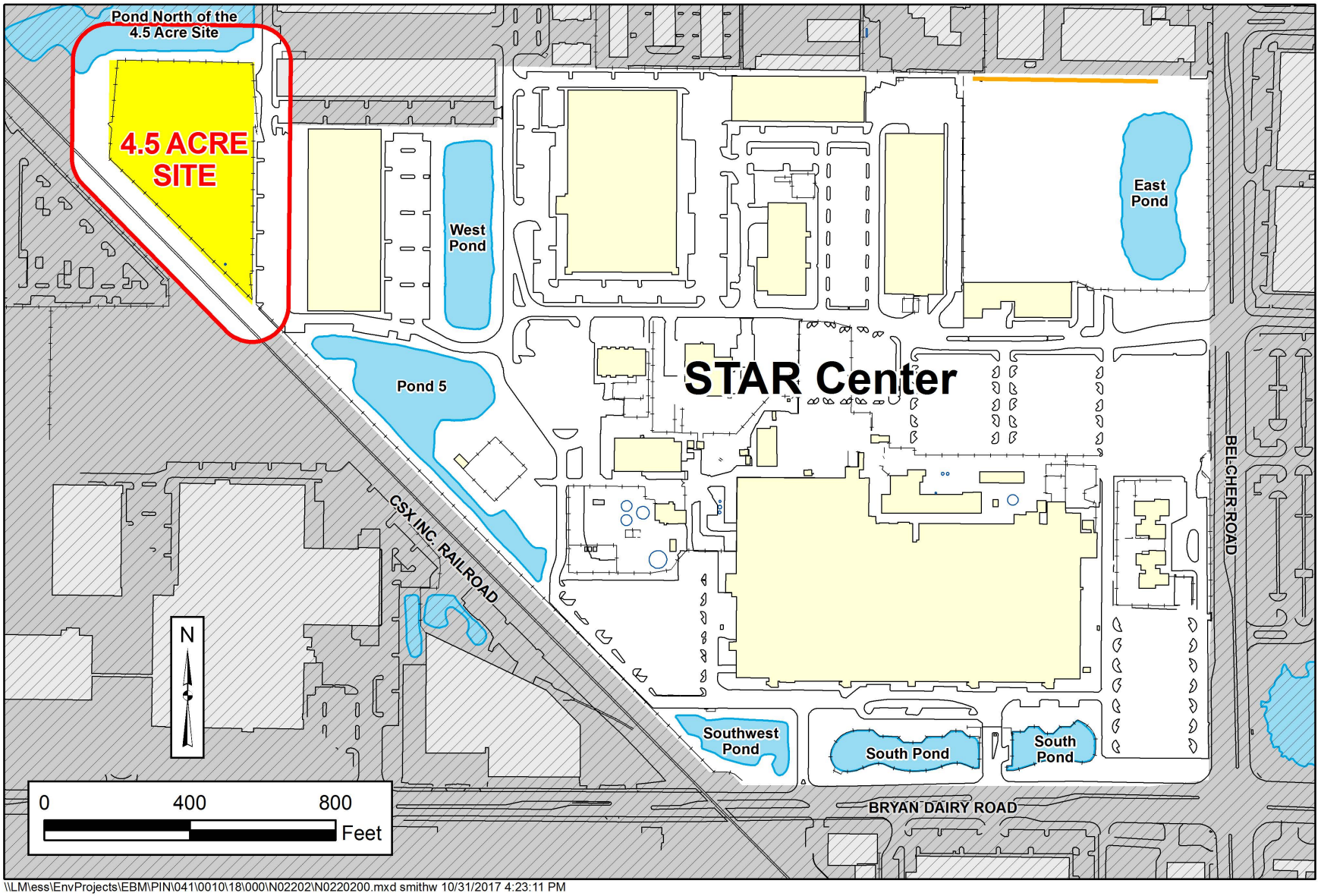

Figure 2. 4.5 Acre Site Location

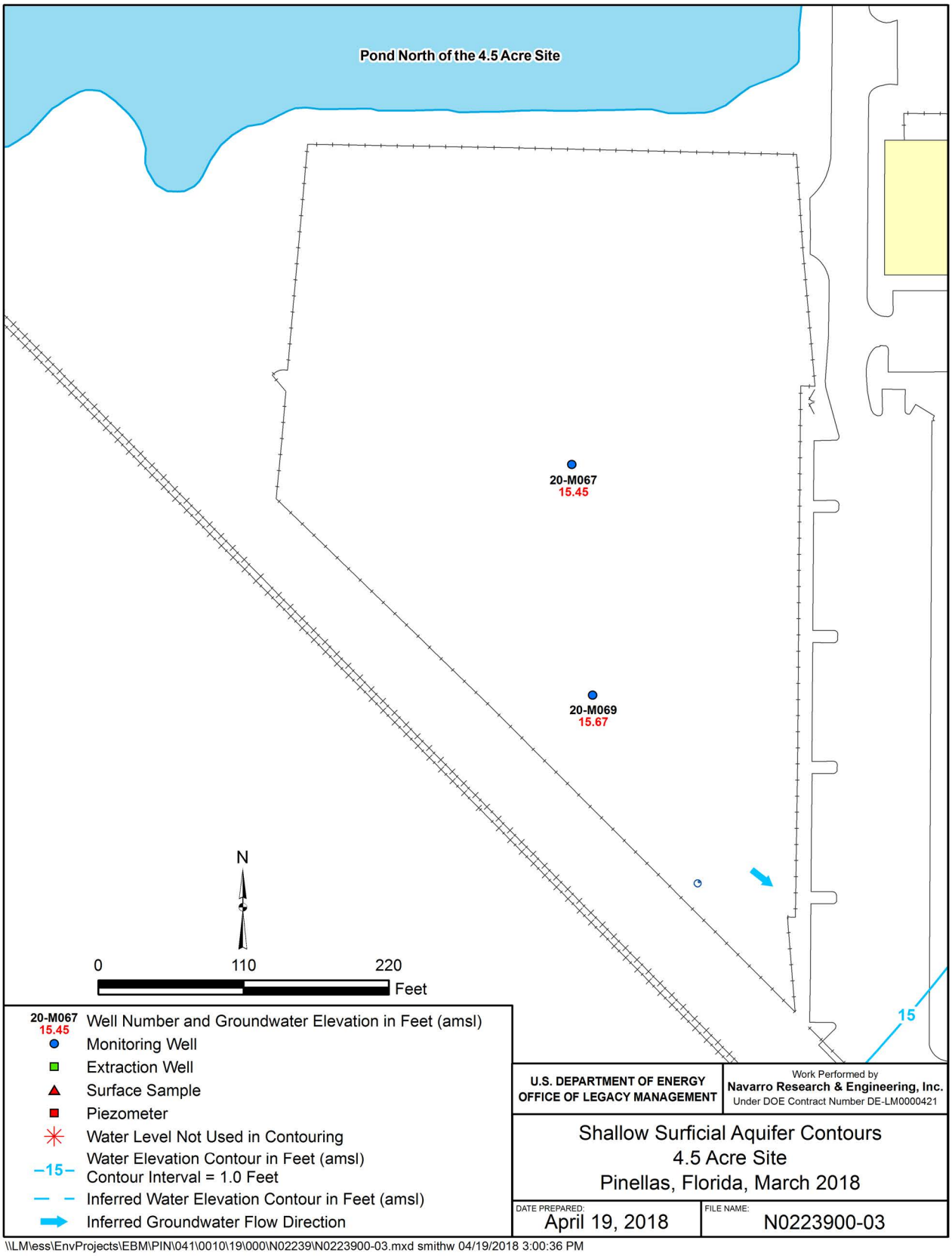

Figure 3. Shallow Surficial Aquifer Flow, March 2018

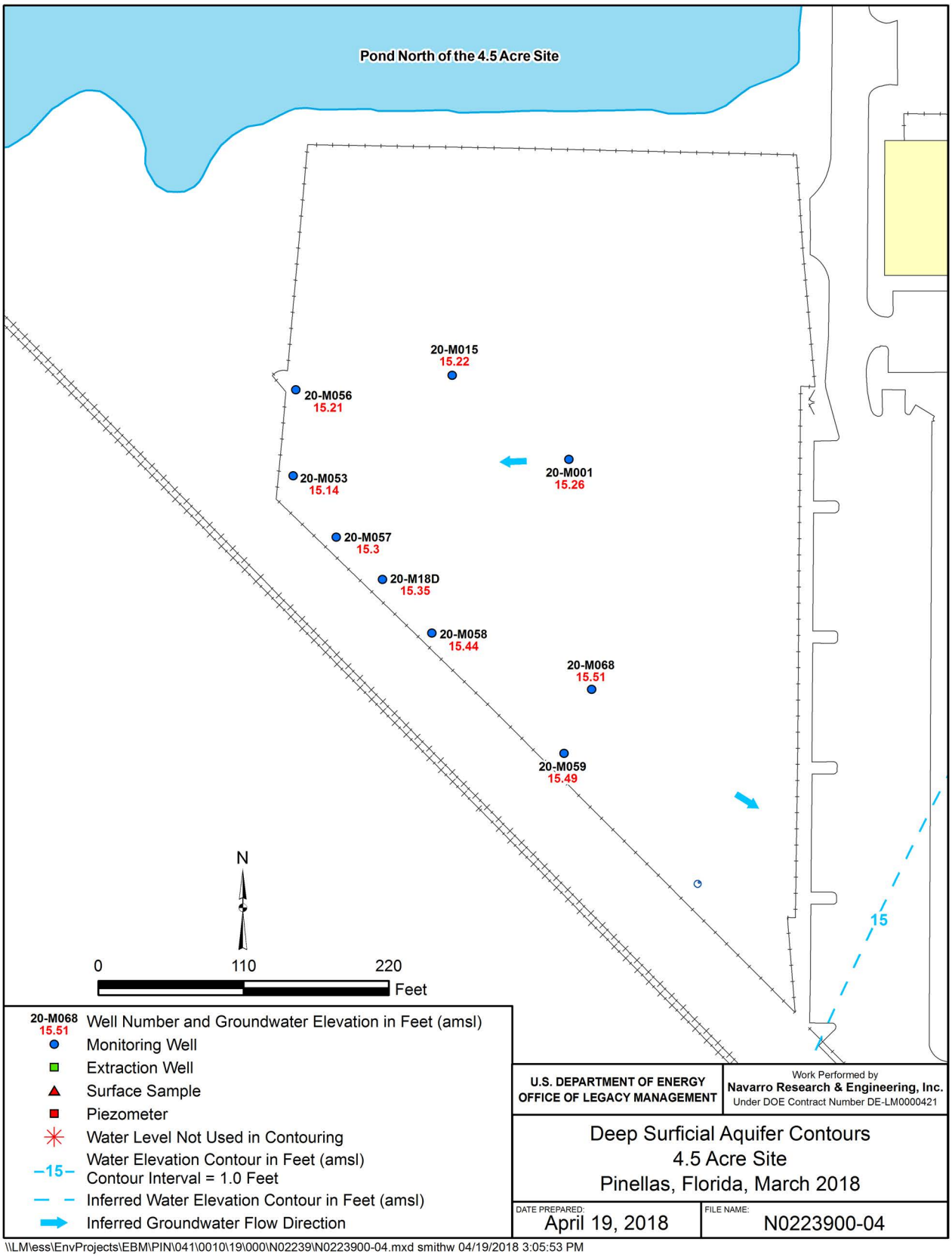

Figure 4. Deep Surficial Aquifer Flow, March 2018

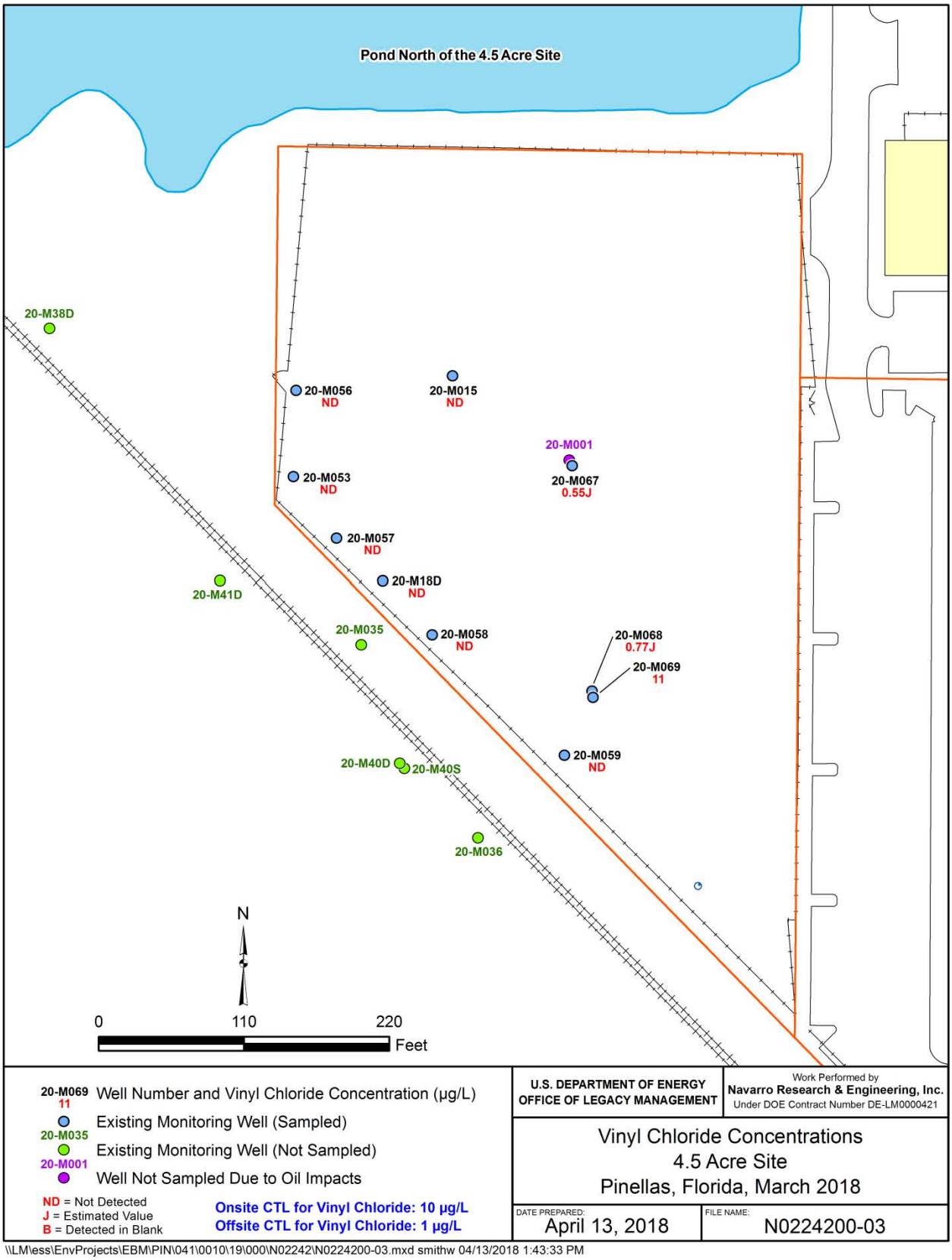

Figure 5. Vinyl Chloride Concentrations, March 2018

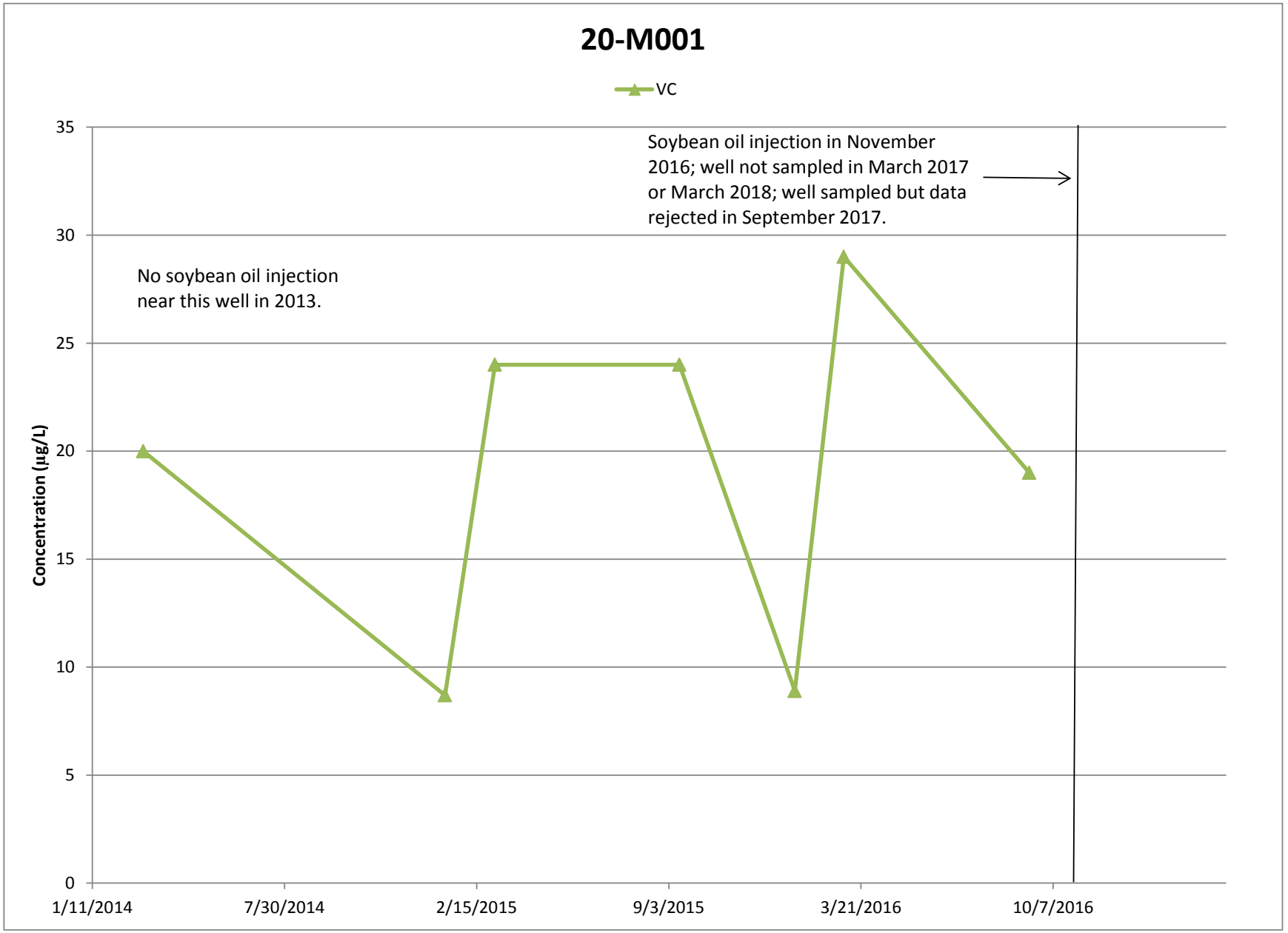

Figure 6. VC in Well 20-M001

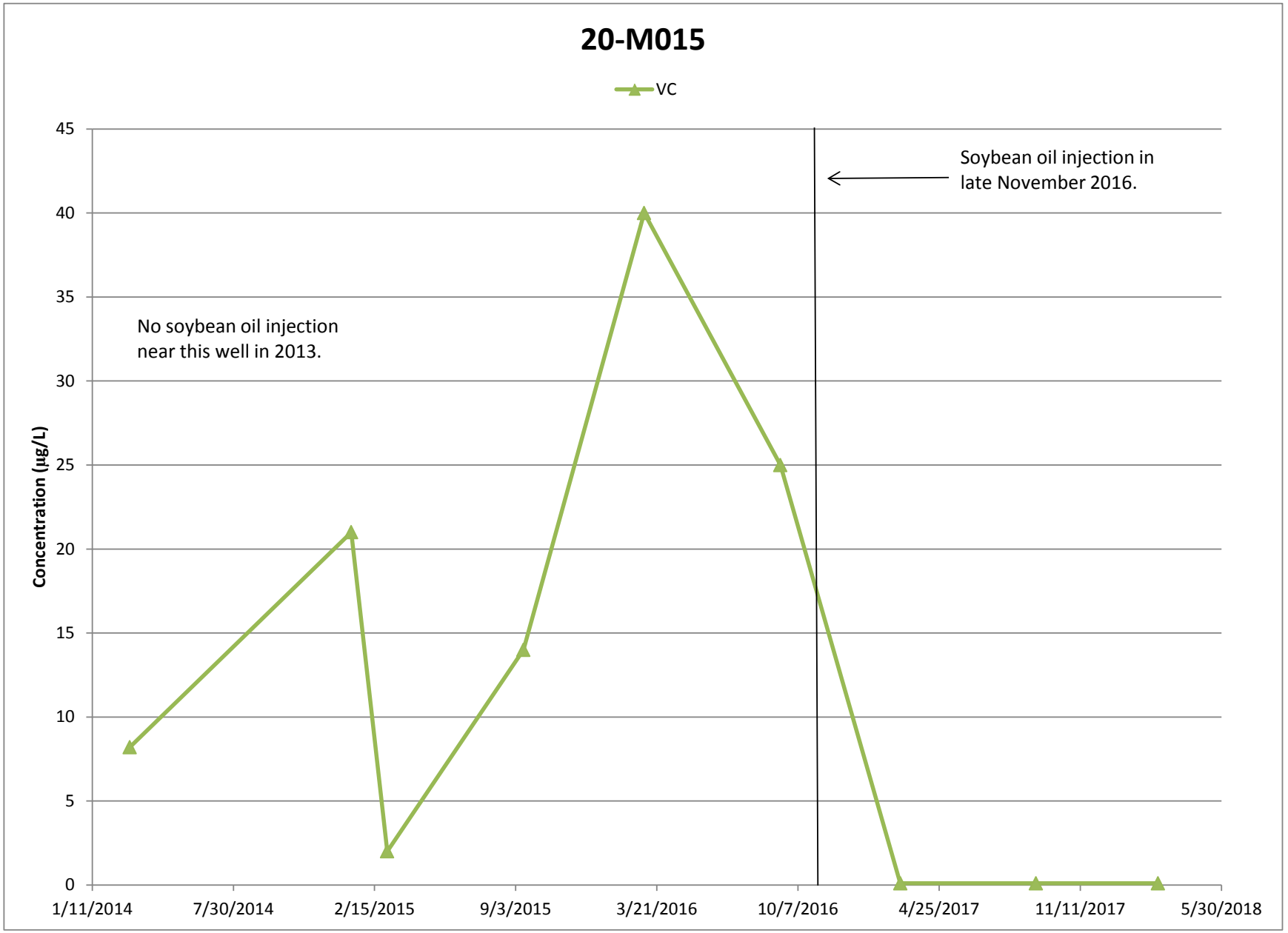

Figure 7. VC in Well 20-M015

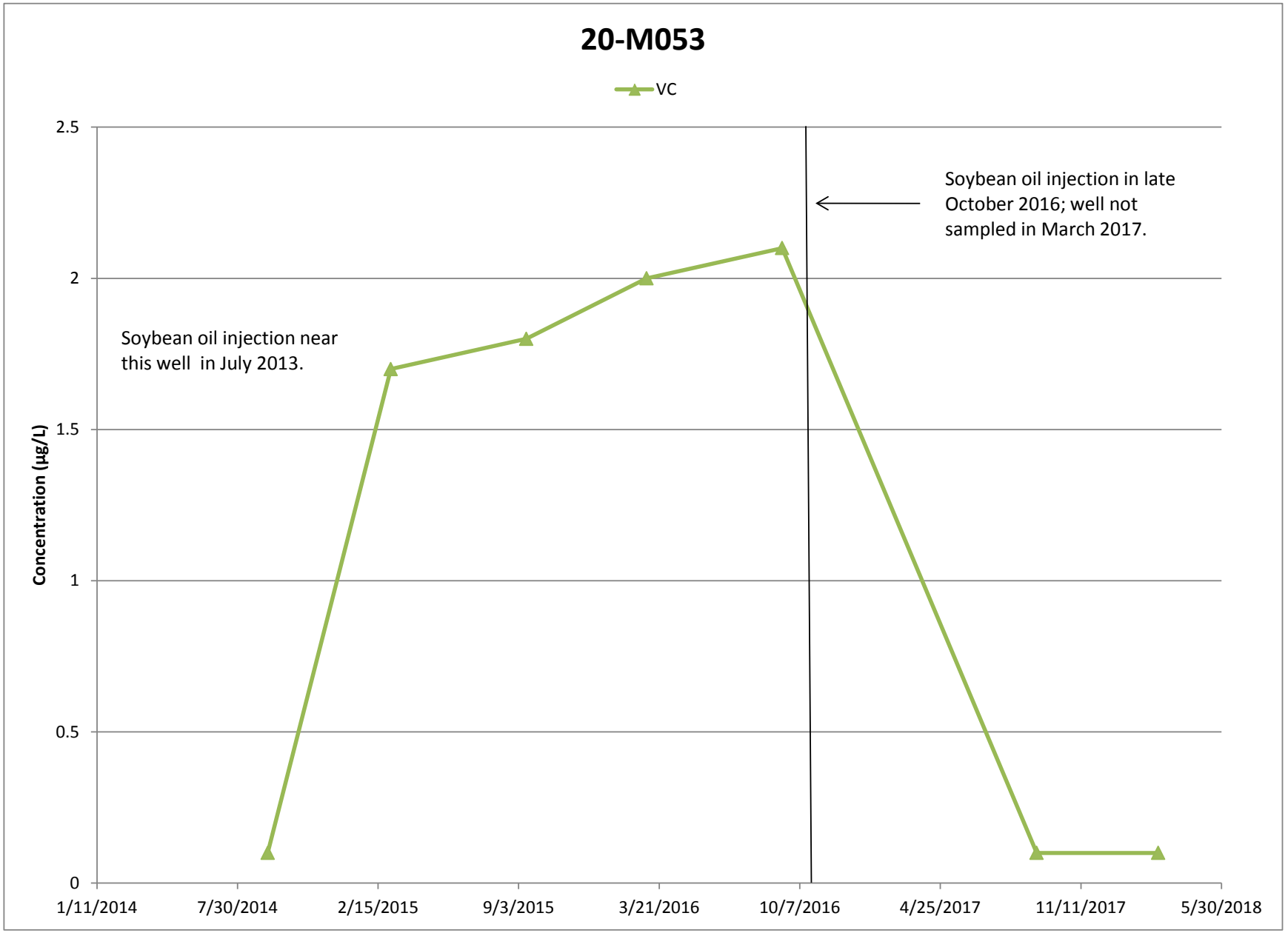

Figure 8. VC in Well 20-M053

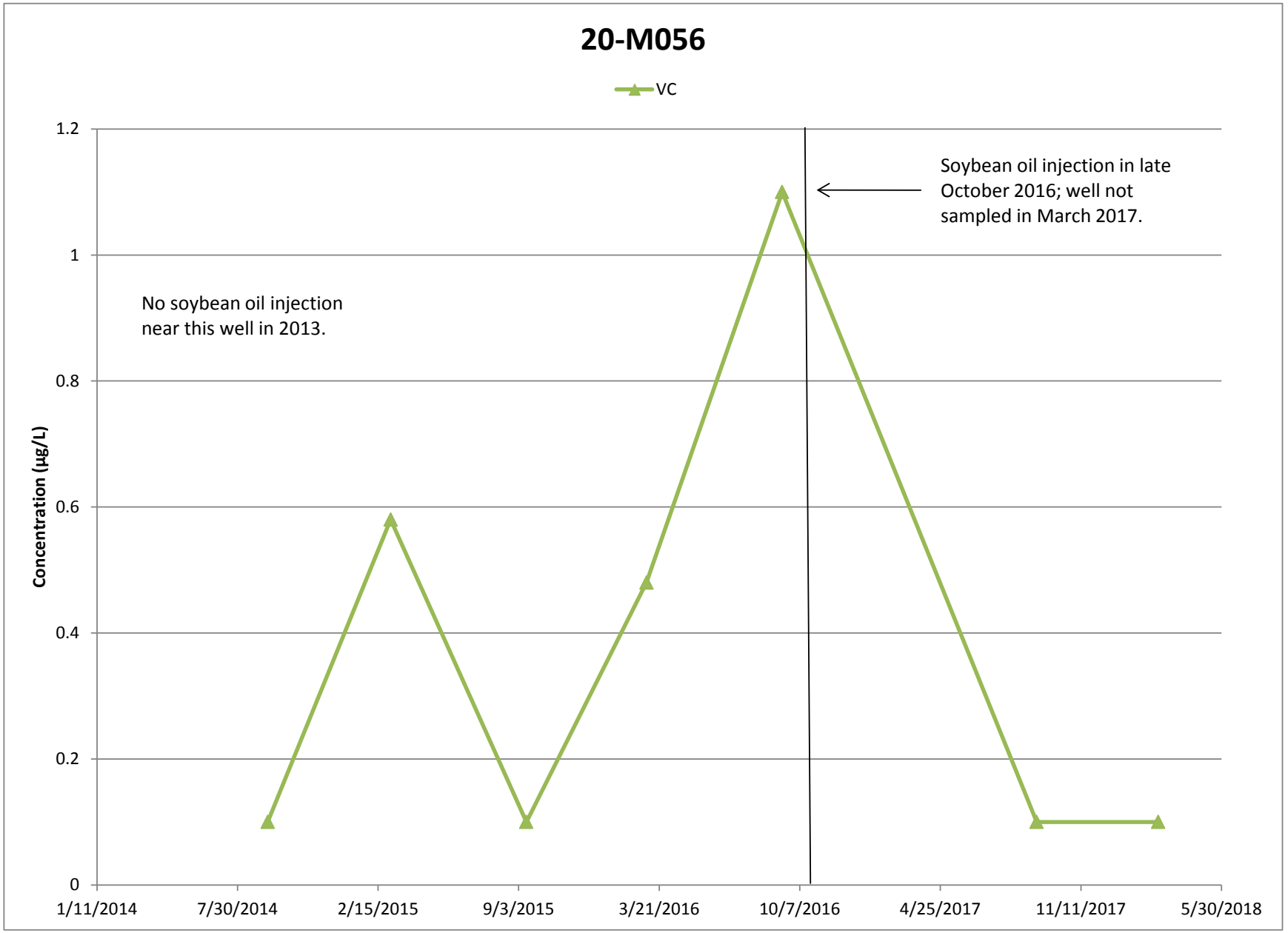

Figure 9. VC in Well 20-M056

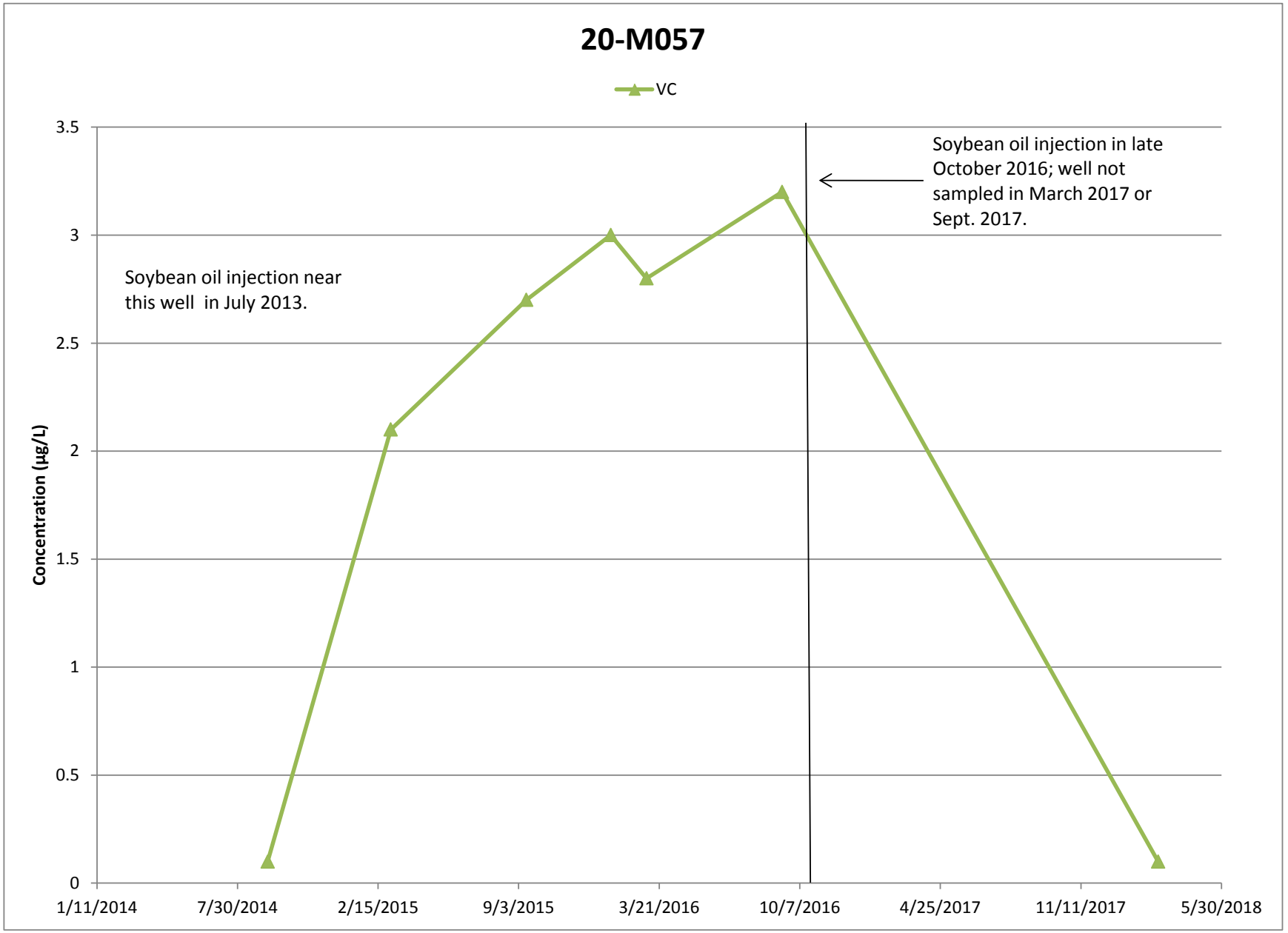

Figure 10. VC in Well 20-M057

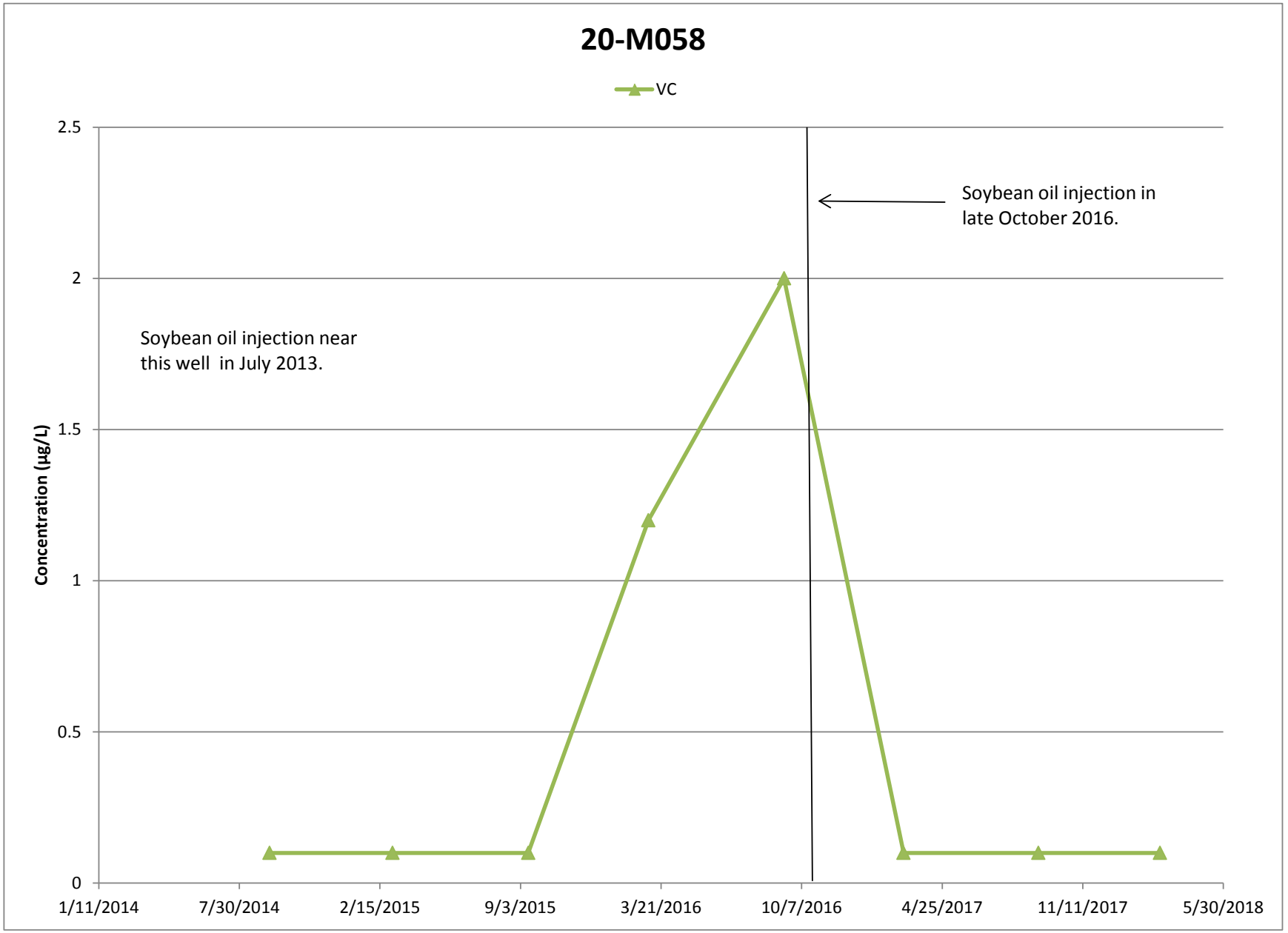

Figure 11. VC in Well 20-M058

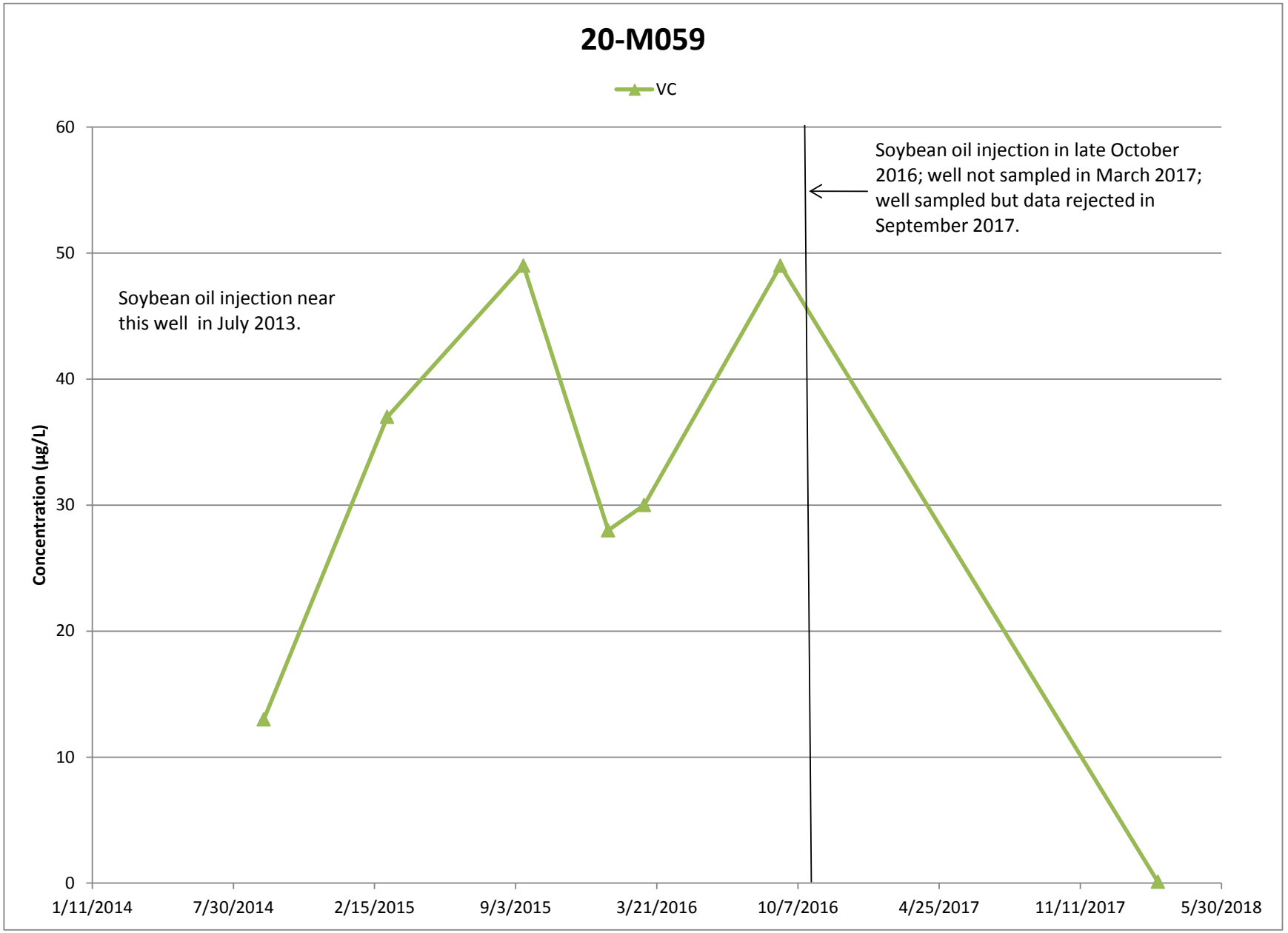

Figure 12. VC in Well 20-M059

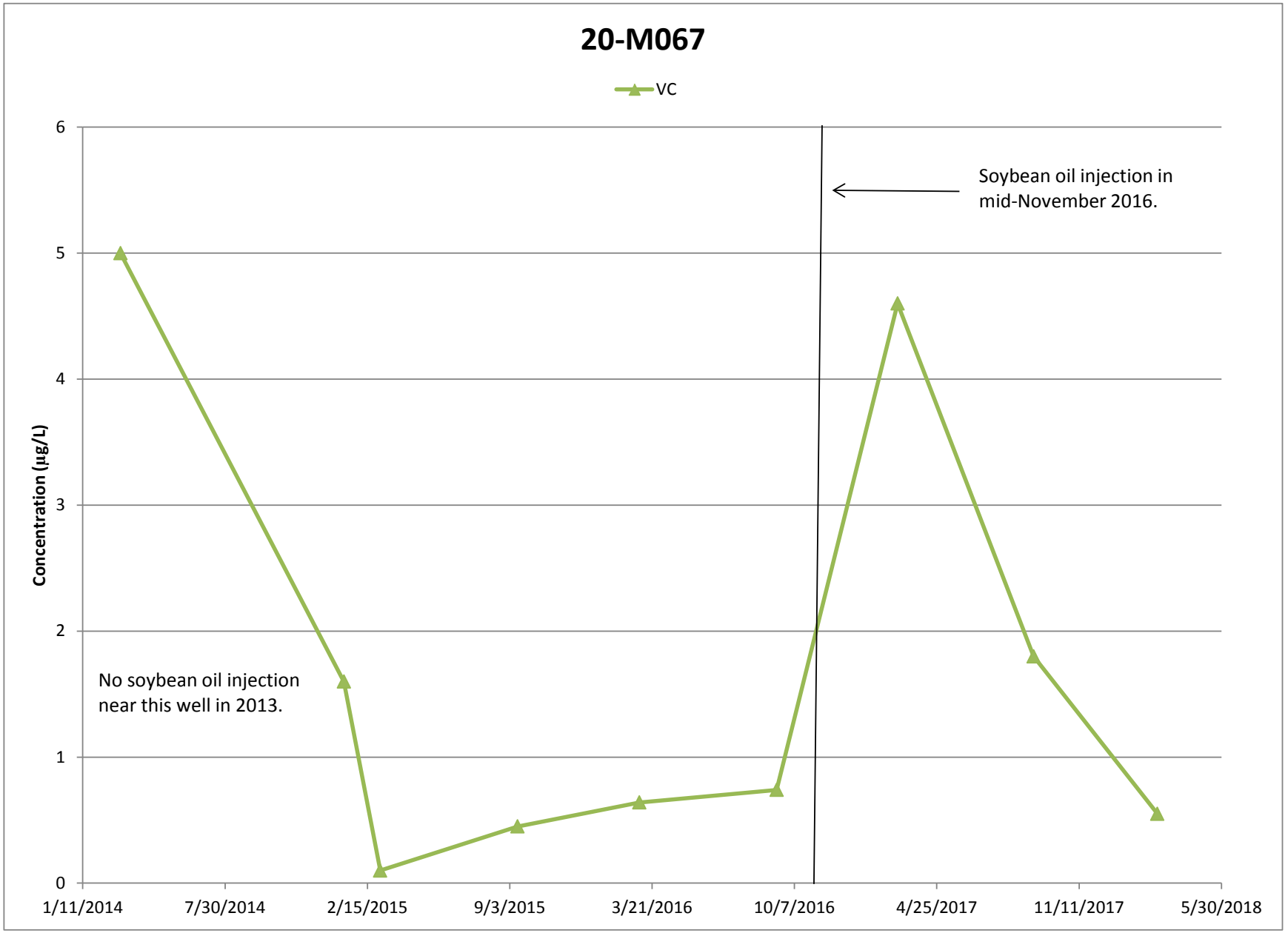

Figure 13. VC in Well 20-M067

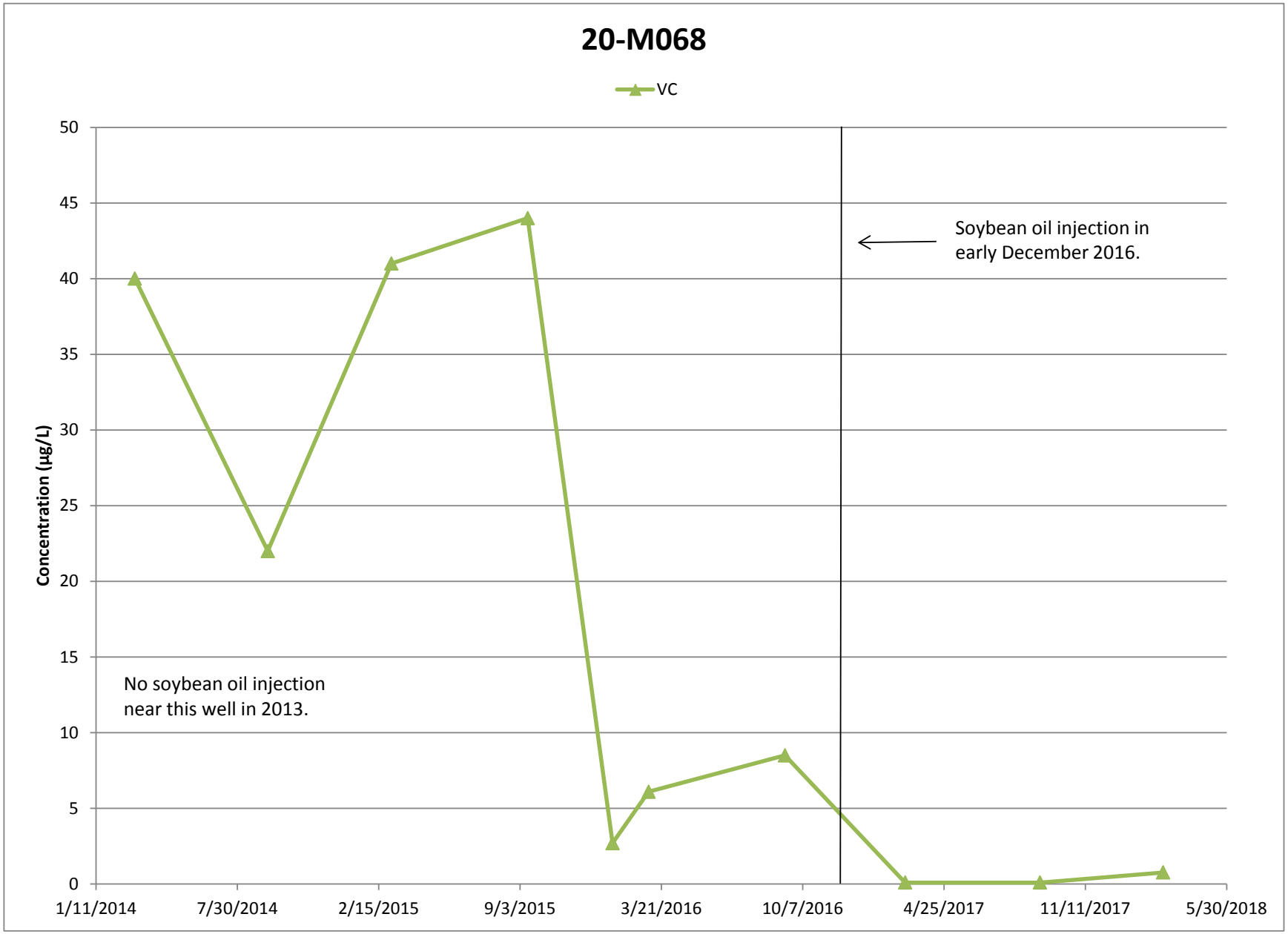

Figure 14. VC in Well 20-M068

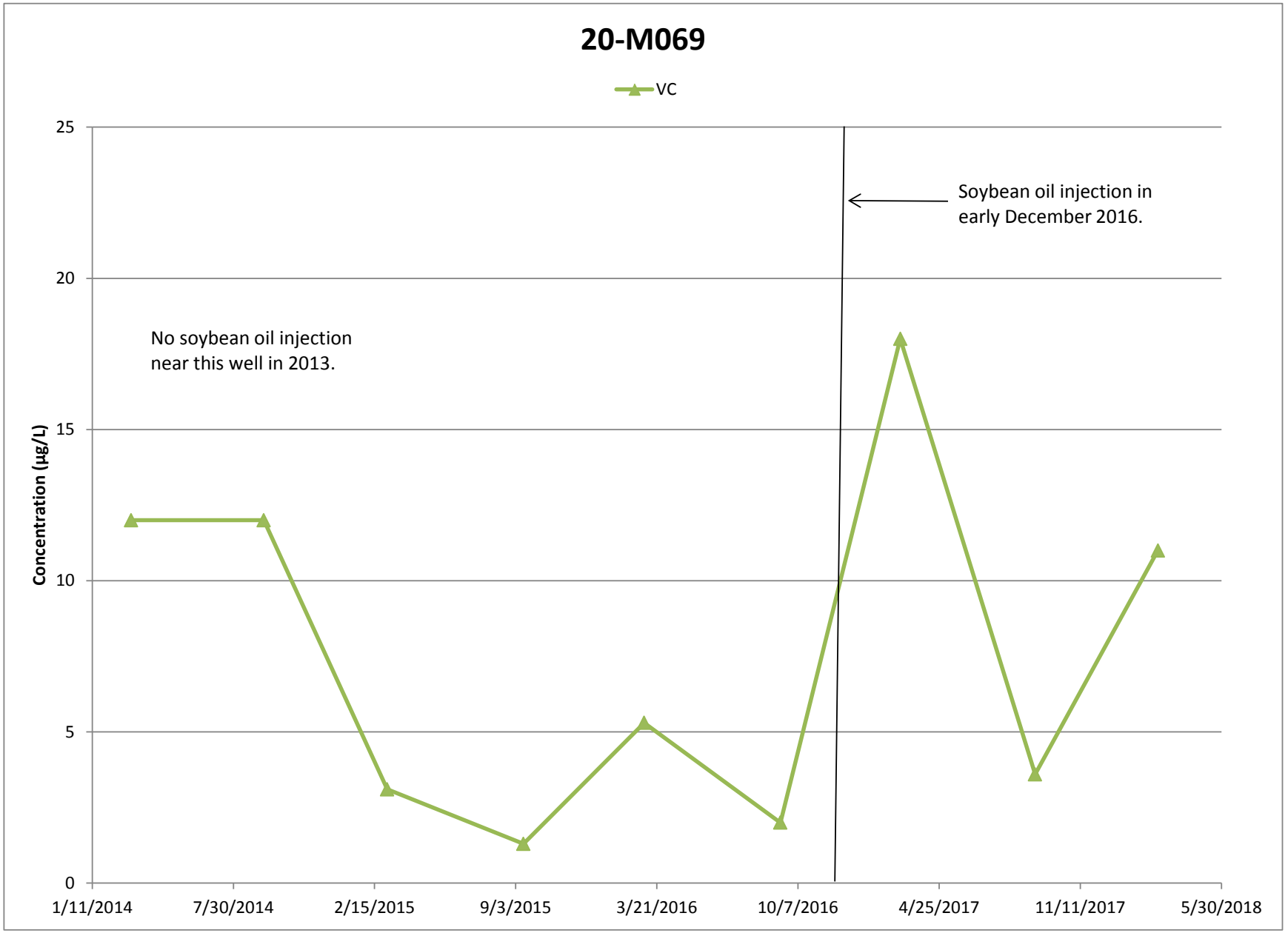

Figure 15. VC in Well 20-M069

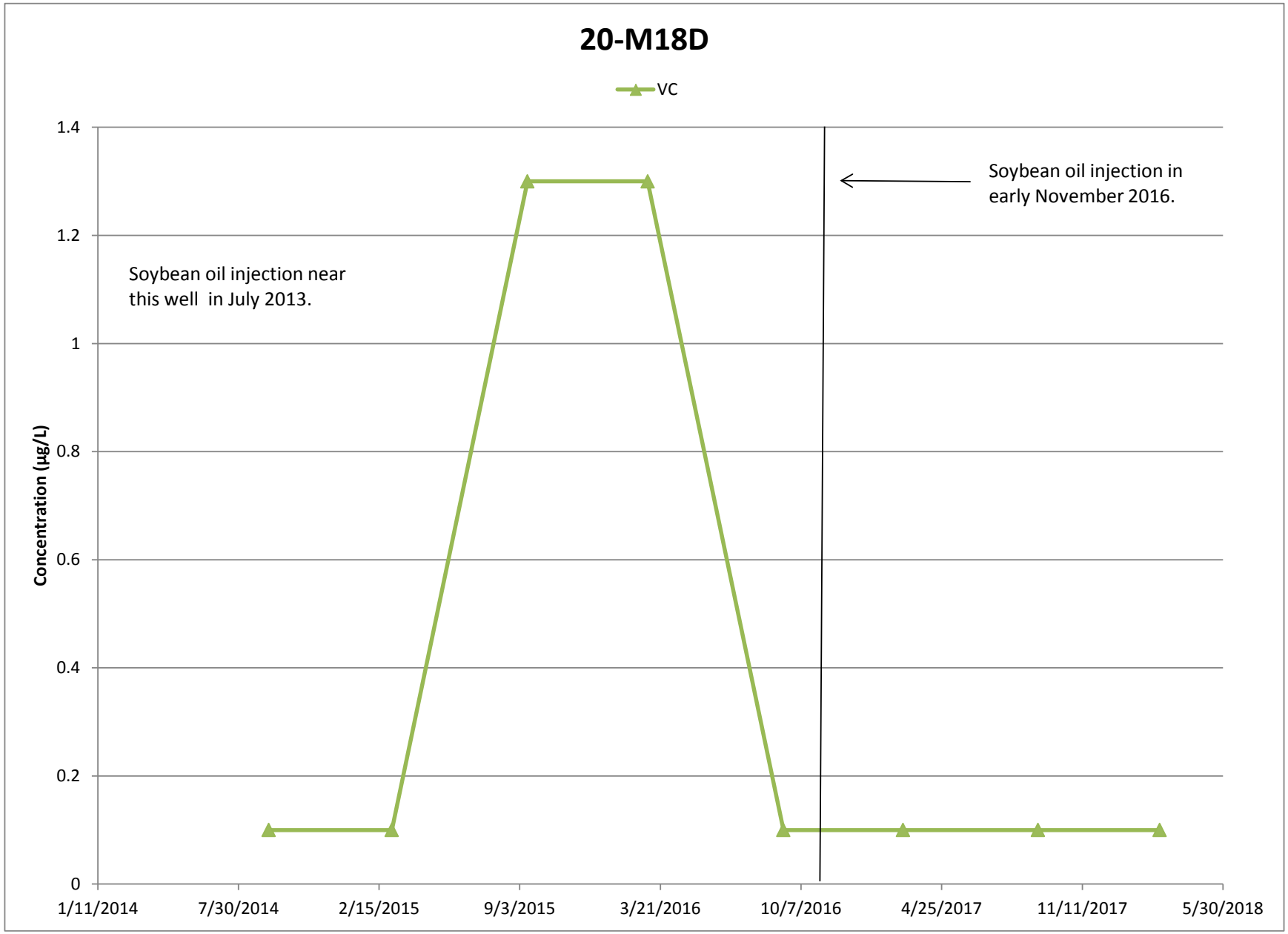

Figure 16. VC in Well 20-M18D

Table 1. Groundwater Elevation Data at the 4.5 Acre Site, March 2018

Location	Measurement		Water Depth (ft bls)	Groundwater Elevation (ft amsl)
	Date	Time		
PIN20				
M001	2/28/2018	9:39	2.34	15.26
M015	2/28/2018	9:56	3.10	15.22
M053	2/28/2018	9:49	2.06	15.14
M056	2/28/2018	9:51	1.89	15.21
M057	2/28/2018	9:48	2.60	15.3
M058	2/28/2018	8:29	2.26	15.44
M059	2/28/2018	9:44	2.31	15.49
M067	2/28/2018	9:40	3.25	15.45
M068	2/28/2018	9:42	2.64	15.51
M069	2/28/2018	9:43	2.33	15.67
M18D	2/28/2018	9:46	2.35	15.35

Abbreviations:
ft amsl = feet above mean sea level
ft bls = feet below land surface

Table 2. Surface Water Elevations at the 4.5 Acre Site, March 2018

Location	Measurement		Surface Water Elevation (ft amsl)
	Date	Time	
PIN01	**Pond 5**		
P501	2/28/2018	13:31	13.66
P503	2/28/2018	13:04	13.95
PIN02	**West Pond**		
W005	2/28/2018	13:24	14.02

Abbreviation:
ft amsl = feet above mean sea level

Table 3. Field Measurements of Samples Collected at the 4.5 Acre Site, March 2018

Location	Screen Depth (ft bls)	Turbidity (NTU)
M001	20–25	404
M015	20.8–25.8	18.8
M053	20–30	17.9
M056	19–29	16.9
M058	18–28	14.1
M059	19–29	80.8
M067	10–20	38.6
M068	20–30	49
M069	10–20	65.8
M18D	20–30	13.1

Abbreviations:
ft bls = feet below land surface
NTU = nephelometric turbidity units

Note:
A full set of field parameters could not be measured in any of the wells due to interference from the injected vegetable oil.

Table 4. COPC Concentrations Since September 2014 (µg/L)[a,b]

Location (all IDs start with PIN20-)	Screen Depth (ft bls)	Date Sampled	TCE	cDCE	tDCE	VC	Benzene	TCOPCs
Cleanup Target Level[c]			**30**	**700**	**1000**	**10**	**10**	
M001	20–25	1/13/2015	<0.16	0.17J	1.5	8.7	0.45J	10.82
		3/6/2015	<0.16	0.52J	1.7	24	0.61J	26.83
		9/14/2015	<0.16	0.84J	2.1	24	0.72J	27.66
		1/12/2016	<0.16	0.71J	1.5	8.9	0.72J	11.83
		3/3/2016	<0.16	0.96J	2.1	29	0.89J	32.95
		9/12/2016	<0.16	1.4	1.8	19	0.81J	23.01
M015	20.8–25.8	1/13/2015	<0.16	12	<0.15	21	<0.16	33
		3/5/2015	<0.16	6.3	<0.15	2	<0.16	8.3
		9/14/2015	<0.16	6.2	<0.15	14	<0.16	20.2
		1/12/2016	<0.16	18	<0.15	37	<0.16	55
		3/3/2016	<0.16	16	<0.15	40	<0.16	56
		9/12/2016	<0.16	9.3	<0.15	25	<0.16	34.3
		3/1/2017	<0.16	3	<0.15	<0.1	<0.16	3
		9/9/2017	<0.16	1.6	<0.15	<0.1	<0.16	1.6
		3/1/2018	<0.16	0.72J	<0.15	<0.1	<0.16	0.72
M053	20–30	9/11/2014	<0.16	1.9	<0.15	<0.1	<0.16	1.9
		3/5/2015	<0.16	2.8	<0.15	1.7	<0.16	4.5
		9/14/2015	<0.16	2.8	<0.15	1.8	<0.16	4.6
		3/3/2016	<0.16	1.8	<0.15	2	<0.16	3.8
		9/12/2016	<0.16	2.3	<0.15	2.1	<0.16	4.4
		9/9/2017	<0.16	3.4	<0.15	<0.1	<0.16	3.4
		3/1/2018	<0.16	2	<0.15	<0.1	<0.16	2
M056	19–29	9/11/2014	<0.16	2.6	<0.15	<0.1	<0.16	2.6
		3/5/2015	<0.16	2.6	<0.15	0.58J	<0.16	3.18
		9/14/2015	<0.16	2.6	<0.15	<0.1	<0.16	2.6
		3/3/2016	<0.16	2.9	<0.15	0.48J	<0.16	3.38
		9/12/2016	<0.16	3.7	<0.15	1.1	<0.16	4.8
		9/9/2017	<0.16	3.6	<0.15	<0.1	<0.16	3.6
		3/1/2018	<0.16	2.7	<0.15	<0.1	<0.16	2.7
M057	20–30	9/11/2014	<0.16	1.9	0.26J	<0.1	<0.16	2.16
		3/5/2015	<0.16	11	0.61J	2.1	<0.16	13.71
		9/14/2015	<0.16	11J	0.86J	2.7J	<0.16	14.56
		1/12/2016	<0.16	1.7	0.26J	3	<0.16	4.96
		3/3/2016	<0.16	1.7	0.16J	2.8	<0.16	4.66
		9/12/2016	<0.16	6.5	0.49J	3.2	<0.16	10.19
		3/1/2018	<0.16	5.5	0.42J	<0.1	<0.16	5.92

Table 4. COPC Concentrations Since September 2014 (µg/L)[a,b] (continued)

Location (all IDs start with PIN20-)	Screen Depth (ft bls)	Date Sampled	TCE	cDCE	tDCE	VC	Benzene	TCOPCs
Cleanup Target Level[c]			**30**	**700**	**1000**	**10**	**10**	
M058	18–28	9/11/2014	<0.16	1.9	0.24J	<0.1	<0.16	2.14
		3/5/2015	<0.16	2.2	0.27J	<0.1	<0.16	2.47
		9/14/2015	<0.16	2.8	0.35J	<0.1	<0.16	3.15
		3/3/2016	<0.16	2	0.22J	1.2	<0.16	3.42
		9/12/2016	<0.16	2.6	0.43J	2	<0.16	5.03
		3/1/2017	<0.16	1.7	0.17J	<0.1	<0.16	1.87
		9/9/2017	<0.16	2.4	0.3J	<0.1	<0.16	2.7
		3/1/2018	<0.16	1.4	0.18J	<0.1	<0.16	1.58
M059	19–29	9/11/2014	<0.16	2	0.52J	13	0.22J	15.74
		3/5/2015	<0.16	4.4	1.3	37	0.26J	42.96
		9/14/2015	<0.16	5.9	2	49	0.29J	57.19
		1/12/2016	<0.16	2.9	0.88J	28	0.28J	32.06
		3/3/2016	<0.16	3.1	0.94J	30	0.3J	34.34
		9/12/2016	<0.16	5.1	1.7	49	0.32J	56.12
		3/1/2018	<0.16	0.39J	0.20J	<0.1	0.51J	1.1
M067	10–20	1/13/2015	<0.16	0.57J	<0.15	1.6	<0.16	2.17
		3/5/2015	<0.16	0.37J	<0.15	<0.1	<0.16	0.37
		9/14/2015	<0.16	0.33J	<0.15	0.45J	<0.16	0.78
		3/3/2016	<0.16	0.39J	<0.15	0.64J	<0.16	1.03
		9/12/2016	<0.16	0.38J	<0.15	0.74J	<0.16	1.12
		3/2/2017	<0.16	1.2	0.23J	4.6	<0.16	6.03
		9/8/2017	<0.16	0.96J	0.24J	1.8	<0.16	3
		3/1/2018	<0.16	0.61J	0.20J	0.55J	<0.16	1.36
M068	20–30	9/11/2014	<0.16	0.2J	1.1	22	0.36J	23.66
		3/5/2015	<0.16	3.2	4.4	41	0.25J	48.85
		9/14/2015	<0.16	3.3	6.2	44	0.26J	53.76
		1/12/2016	<0.16	<0.15	0.98J	2.7	0.29J	3.97
		3/3/2016	<0.16	0.23J	1.4	6.1	0.28J	8.01
		9/12/2016	<0.16	0.43J	2.5	8.5	0.28J	11.71
		3/2/2017	<0.16	<0.15	0.16J	<0.1	0.39J	0.55
		9/8/2017	<0.16	<0.15	0.35J	<0.1	0.49J	0.84
		3/1/2018	<0.16	<0.15	0.42J	0.77J	0.42J	1.61

Table 4. COPC Concentrations Since September 2014 (µg/L)[a,b] (continued)

Location (all IDs start with PIN20-)	Screen Depth (ft bls)	Date Sampled	TCE	cDCE	tDCE	VC	Benzene	TCOPCs
Cleanup Target Level[c]			**30**	**700**	**1000**	**10**	**10**	
M069	10–20	9/11/2014	<0.16	11	4.2	12	<0.16	27.2
		3/5/2015	<0.16	6	1.8	3.1	<0.16	10.9
		9/14/2015	<0.16	4.7	1.5	1.3	<0.16	7.5
		3/3/2016	<0.16	6.4	2.3	5.3	<0.16	14
		9/12/2016	<0.16	3.6	1.5	2	<0.16	7.1
		3/2/2017	<0.16	7.2	3.4	18	<0.16	28.6
		9/8/2017	<0.16	5.3	2.1	3.6	<0.16	11
		3/1/2018	<0.16	6.2	2.4	11	<0.16	19.6
M18D	20–30	9/11/2014	<0.16	3.3	0.36J	<0.1	<0.16	3.66
		3/5/2015	<0.16	0.62J	<0.15	<0.1	<0.16	0.62
		9/14/2015	<0.16	0.99J	<0.15	1.3J	<0.16	2.29
		3/3/2016	<0.16	0.53J	<0.15	1.3	<0.16	1.83
		9/12/2016	<0.16	0.37J	<0.15	<0.1	<0.16	0.37
		3/1/2017	<0.16	1.1	<0.15	<0.1	<0.16	1.1
		9/9/2017	<0.16	0.6J	<0.15	<0.1	<0.16	0.6
		3/1/2018	<0.16	0.70J	<0.15	<0.1	<0.16	0.7

Notes:
[a] The "<" values are method detection limits.
[b] Not all wells were sampled during every sampling event.
[c] The offsite CTL is a factor of 10 lower than the listed onsite (poor water quality) CTL.

Abbreviations:
ft bls = feet below land surface
J = estimated value

Table 5. Relative Percent Difference for Duplicate Samples, March 2018 (Results in µg/L)

Sample ID	Duplicate ID	Analyte	Result	Dup Result	MDL	RPD
PIN20-M058	PIN20-2860	*cis*-1,2-Dichloroethene	1.4	1.3	0.15	7.4
PIN20-M068	PIN20-2862	Vinyl chloride	0.77	0.76	0.10	1.3

Abbreviations:
Dup = duplicate
MDL = method detection limit

Appendix A

Laboratory Reports

March 2018 Semiannual Monitoring

ANALYTICAL REPORT

Job Number: 280-106969-1

SDG Number: PIN20-01.1802001

Job Description: PINELLAS 4.5 ACRE SITE

For:
Navarro Research and Engineering, Inc
2597 Legacy Way
Grand Junction, CO 81503

Attention: Mr. Steve Donivan

Approved for release.
DiLea R Bindel
Project Manager I
3/12/2018 10:16 PM

DiLea R Bindel, Project Manager I
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0173
dilea.bindel@testamericainc.com
03/12/2018

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

Pages have been deleted from this laboratory report file to reduce file size. The deleted pages contain raw data and instrument calibrations. If the full laboratory report is needed, contact Scott.Surovchak@lm.doe.gov

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CASE NARRATIVE

Client: Navarro Research and Engineering, Inc.

Project: PINELLAS 4.5 ACRE SITE - PIN20-01.1802001

Report Number: 280-106969-1

With exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory quality control samples analyzed in conjunction with the samples in this project were within established control limits, with any exceptions noted. Calculations are performed before rounding to avoid round-off errors in calculated results.

This report includes reporting limits (RLs) less than TestAmerica Denver's practical quantitation limits. These reporting limits are being used specifically at the client's request to meet the needs of this project. Please note that data are not normally reported to these levels without qualification, since they are inherently less reliable and potentially less defensible than required by the current NELAC standards.

Results between the method detection limit (MDL) and reporting limit (RL) are flagged with a "J" qualifier to indicate an estimated value. These results are statistically less reliable than results greater than or equal to the RL and should be considered a qualitative value.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 3/3/2018 8:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOLATILES - SW846 8260B

Due to high concentrations of target analytes, sample PIN20-01.1802001-006 (M059) had to be analyzed at a dilution. The reporting limits have been elevated accordingly. To provide the lowest possible detection limits, multiple runs are reported.

The following sample was received with acidic preservative (pH<2) but had a pH of 4: PIN20-01.1802001-006 (M059). The sample was collected on 3/1/18 and analyzed within the 7-day holding time for unpreserved volume.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DATA REPORTING QUALIFIERS

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Lab Section	Qualifier	Description
GC/MS VOA		
	J	Estimated: The analyte was positively identified; the quantitation is an estimation
	*	MS/MSD RPD exceeded the control limit
	U	Undetected at the Limit of Detection.

SAMPLE SUMMARY

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-106969-1	PIN20-01.1802001.011	Water	03/01/2018 1200	03/03/2018 0830
280-106969-1MS	PIN20-01.1802001.011	Water	03/01/2018 1200	03/03/2018 0830
280-106969-1MSD	PIN20-01.1802001.011	Water	03/01/2018 1200	03/03/2018 0830
280-106969-2	PIN20-01.1802001.012	Water	03/01/2018 0800	03/03/2018 0830
280-106969-3	PIN20-01.1802001.014	Water	03/01/2018 1205	03/03/2018 0830
280-106969-4	PIN20-01.1802001-002	Water	03/01/2018 1315	03/03/2018 0830
280-106969-5	PIN20-01.1802001-003	Water	03/01/2018 1120	03/03/2018 0830
280-106969-6	PIN20-01.1802001-004	Water	03/01/2018 1230	03/03/2018 0830
280-106969-7	PIN20-01.1802001-005	Water	03/01/2018 0830	03/03/2018 0830
280-106969-8	PIN20-01.1802001-006	Water	03/01/2018 1645	03/03/2018 0830
280-106969-9	PIN20-01.1802001-007	Water	03/01/2018 1630	03/03/2018 0830
280-106969-10	PIN20-01.1802001-008	Water	03/01/2018 1505	03/03/2018 0830
280-106969-11	PIN20-01.1802001-009	Water	03/01/2018 1545	03/03/2018 0830
280-106969-12	PIN20-01.1802001-010	Water	03/01/2018 0935	03/03/2018 0830
280-106969-13	PIN20-01.1802001-013	Water	03/01/2018 1030	03/03/2018 0830

EXECUTIVE SUMMARY - Detections

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-106969-1	**PIN20-01.1802001.011**					
Acetone		7.0	J	10	ug/L	8260B
cis-1,2-Dichloroethene		1.3		1.0	ug/L	8260B
trans-1,2-Dichloroethene		0.17	J	1.0	ug/L	8260B
280-106969-2	**PIN20-01.1802001.012**					
Acetone		16		10	ug/L	8260B
Chloroform		0.31	J	1.0	ug/L	8260B
Methylene Chloride		3.3		1.0	ug/L	8260B
280-106969-3	**PIN20-01.1802001.014**					
Acetone		13		10	ug/L	8260B
Benzene		0.43	J	1.0	ug/L	8260B
trans-1,2-Dichloroethene		0.42	J	1.0	ug/L	8260B
Toluene		0.32	J	1.0	ug/L	8260B
Vinyl chloride		0.76	J	1.0	ug/L	8260B
280-106969-4	**PIN20-01.1802001-002**					
Acetone		11		10	ug/L	8260B
Carbon disulfide		0.69	J	1.0	ug/L	8260B
cis-1,2-Dichloroethene		0.72	J	1.0	ug/L	8260B
trans-1,3-Dichloropropene		0.81	J	1.0	ug/L	8260B
280-106969-5	**PIN20-01.1802001-003**					
Acetone		51		10	ug/L	8260B
2-Butanone (MEK)		43		5.0	ug/L	8260B
cis-1,2-Dichloroethene		2.0		1.0	ug/L	8260B
trans-1,3-Dichloropropene		1.2		1.0	ug/L	8260B
280-106969-6	**PIN20-01.1802001-004**					
Acetone		15		10	ug/L	8260B
2-Butanone (MEK)		7.1		5.0	ug/L	8260B
cis-1,2-Dichloroethene		2.7		1.0	ug/L	8260B
trans-1,3-Dichloropropene		1.7		1.0	ug/L	8260B
280-106969-7	**PIN20-01.1802001-005**					
Acetone		10		10	ug/L	8260B
cis-1,2-Dichloroethene		1.4		1.0	ug/L	8260B
trans-1,2-Dichloroethene		0.18	J	1.0	ug/L	8260B
trans-1,3-Dichloropropene		1.6		1.0	ug/L	8260B

EXECUTIVE SUMMARY - Detections

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-106969-8	**PIN20-01.1802001-006**					
Acetone		240		10	ug/L	8260B
Benzene		0.51	J	1.0	ug/L	8260B
2-Butanone (MEK)		380		20	ug/L	8260B
cis-1,2-Dichloroethene		0.39	J	1.0	ug/L	8260B
trans-1,2-Dichloroethene		0.20	J	1.0	ug/L	8260B
Ethylbenzene		0.35	J	1.0	ug/L	8260B
2-Hexanone		5.7		5.0	ug/L	8260B
4-Methyl-2-pentanone		6.9		5.0	ug/L	8260B
Toluene		0.27	J	1.0	ug/L	8260B
280-106969-9	**PIN20-01.1802001-007**					
Acetone		7.6	J	10	ug/L	8260B
cis-1,2-Dichloroethene		0.61	J	1.0	ug/L	8260B
trans-1,2-Dichloroethene		0.20	J	1.0	ug/L	8260B
Vinyl chloride		0.55	J	1.0	ug/L	8260B
280-106969-10	**PIN20-01.1802001-008**					
Acetone		9.2	J	10	ug/L	8260B
Benzene		0.42	J	1.0	ug/L	8260B
trans-1,2-Dichloroethene		0.42	J	1.0	ug/L	8260B
Toluene		0.33	J	1.0	ug/L	8260B
Vinyl chloride		0.77	J	1.0	ug/L	8260B
280-106969-11	**PIN20-01.1802001-009**					
Acetone		6.8	J	10	ug/L	8260B
cis-1,2-Dichloroethene		6.2		1.0	ug/L	8260B
trans-1,2-Dichloroethene		2.4		1.0	ug/L	8260B
Vinyl chloride		11		1.0	ug/L	8260B
280-106969-12	**PIN20-01.1802001-010**					
Acetone		8.7	J	10	ug/L	8260B
Carbon disulfide		0.65	J	1.0	ug/L	8260B
cis-1,2-Dichloroethene		0.70	J	1.0	ug/L	8260B
trans-1,3-Dichloropropene		2.2		1.0	ug/L	8260B
Toluene		0.30	J	1.0	ug/L	8260B

EXECUTIVE SUMMARY - Detections

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Lab Sample ID / Analyte	Client Sample ID	Result	Qualifier	Reporting Limit	Units	Method
280-106969-13	**PIN20-01.1802001-013**					
Acetone		110		10	ug/L	8260B
2-Butanone (MEK)		140		5.0	ug/L	8260B
Carbon disulfide		0.98	J	1.0	ug/L	8260B
cis-1,2-Dichloroethene		5.5		1.0	ug/L	8260B
trans-1,2-Dichloroethene		0.42	J	1.0	ug/L	8260B
trans-1,3-Dichloropropene		1.1		1.0	ug/L	8260B
2-Hexanone		2.7	J	5.0	ug/L	8260B

METHOD SUMMARY

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds (GC/MS)	TAL DEN	SW846 8260B	
Purge and Trap	TAL DEN		SW846 5030B

Lab References:

TAL DEN = TestAmerica Denver

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Method	Analyst	Analyst ID
SW846 8260B	Dobransky, Michael E	MD

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001.011**

Lab Sample ID: 280-106969-1
Client Matrix: Water

Date Sampled: 03/01/2018 1200
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6971.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1010			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1010				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	7.0	J	1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	1.3		0.15	1.0
trans-1,2-Dichloroethene	0.17	J	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001.011**

Lab Sample ID: 280-106969-1
Client Matrix: Water

Date Sampled: 03/01/2018 1200
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6971.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1010			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1010				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	86		70 - 127
Toluene-d8 (Surr)	91		80 - 125
4-Bromofluorobenzene (Surr)	85		78 - 120
Dibromofluoromethane (Surr)	90		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001.012**

Lab Sample ID: 280-106969-2
Client Matrix: Water

Date Sampled: 03/01/2018 0800
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6980.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1315			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1315				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	16		1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.31	J	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	3.3		0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001.012**

Lab Sample ID: 280-106969-2
Client Matrix: Water

Date Sampled: 03/01/2018 0800
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6980.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1315			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1315				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 127
Toluene-d8 (Surr)	95		80 - 125
4-Bromofluorobenzene (Surr)	88		78 - 120
Dibromofluoromethane (Surr)	97		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001.014**

Lab Sample ID: 280-106969-3
Client Matrix: Water

Date Sampled: 03/01/2018 1205
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6981.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1334			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1334				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	13		1.9	10
Benzene	0.43	J	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,2-Dichloroethene	0.42	J	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001.014**

Lab Sample ID: 280-106969-3
Client Matrix: Water

Date Sampled: 03/01/2018 1205
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6981.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1334			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1334				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.32	J	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.76	J	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	94		70 - 127
Toluene-d8 (Surr)	94		80 - 125
4-Bromofluorobenzene (Surr)	86		78 - 120
Dibromofluoromethane (Surr)	94		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-002**

Lab Sample ID: 280-106969-4
Client Matrix: Water

Date Sampled: 03/01/2018 1315
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6982.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1353			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1353				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	11		1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.69	J	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.72	J	0.15	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.81	J	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-002**

Lab Sample ID: 280-106969-4
Client Matrix: Water

Date Sampled: 03/01/2018 1315
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6982.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1353			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1353				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	94		70 - 127
Toluene-d8 (Surr)	93		80 - 125
4-Bromofluorobenzene (Surr)	87		78 - 120
Dibromofluoromethane (Surr)	94		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-003**

Lab Sample ID: 280-106969-5
Client Matrix: Water

Date Sampled: 03/01/2018 1120
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6983.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1412			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1412				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	51		1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	43		2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	2.0		0.15	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	1.2		0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-003**

Lab Sample ID: 280-106969-5
Client Matrix: Water

Date Sampled: 03/01/2018 1120
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6983.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1412			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1412				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	95		70 - 127
Toluene-d8 (Surr)	91		80 - 125
4-Bromofluorobenzene (Surr)	87		78 - 120
Dibromofluoromethane (Surr)	96		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-004**

Lab Sample ID: 280-106969-6
Client Matrix: Water

Date Sampled: 03/01/2018 1230
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6984.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1431			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1431				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	15		1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	7.1		2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	2.7		0.15	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	1.7		0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-004**

Lab Sample ID: 280-106969-6
Client Matrix: Water

Date Sampled: 03/01/2018 1230
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6984.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1431			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1431				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 127
Toluene-d8 (Surr)	93		80 - 125
4-Bromofluorobenzene (Surr)	88		78 - 120
Dibromofluoromethane (Surr)	98		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-005**

Lab Sample ID: 280-106969-7
Client Matrix: Water

Date Sampled: 03/01/2018 0830
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6985.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1450			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1450				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	10		1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	1.4		0.15	1.0
trans-1,2-Dichloroethene	0.18	J	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	1.6		0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: PIN20-01.1802001-005

Lab Sample ID: 280-106969-7
Client Matrix: Water

Date Sampled: 03/01/2018 0830
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6985.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1450			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1450				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	102		70 - 127
Toluene-d8 (Surr)	96		80 - 125
4-Bromofluorobenzene (Surr)	91		78 - 120
Dibromofluoromethane (Surr)	100		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-006**

Lab Sample ID: 280-106969-8
Client Matrix: Water

Date Sampled: 03/01/2018 1645
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6972.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1029			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1029				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	240		1.9	10
Benzene	0.51	J	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.39	J	0.15	1.0
trans-1,2-Dichloroethene	0.20	J	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.35	J	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	5.7		1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	6.9		0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0
Styrene	0.17	U	0.17	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-006**

Lab Sample ID: 280-106969-8
Client Matrix: Water

Date Sampled: 03/01/2018 1645
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6972.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1029			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1029				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.27	J	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 127
Toluene-d8 (Surr)	89		80 - 125
4-Bromofluorobenzene (Surr)	82		78 - 120
Dibromofluoromethane (Surr)	93		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-006**

Lab Sample ID: 280-106969-8
Client Matrix: Water

Date Sampled: 03/01/2018 1645
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6991.D
Dilution:	4.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1646	Run Type:	DL	Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1646				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
2-Butanone (MEK)	380		8.0	20

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	117		70 - 127
Toluene-d8 (Surr)	93		80 - 125
4-Bromofluorobenzene (Surr)	89		78 - 120
Dibromofluoromethane (Surr)	106		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-007**

Lab Sample ID: 280-106969-9
Client Matrix: Water

Date Sampled: 03/01/2018 1630
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6986.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1510			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1510				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	7.6	J	1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.61	J	0.15	1.0
trans-1,2-Dichloroethene	0.20	J	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-007**

Lab Sample ID: 280-106969-9
Client Matrix: Water

Date Sampled: 03/01/2018 1630
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6986.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1510			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1510				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.55	J	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	100		70 - 127
Toluene-d8 (Surr)	98		80 - 125
4-Bromofluorobenzene (Surr)	89		78 - 120
Dibromofluoromethane (Surr)	100		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-008**

Lab Sample ID: 280-106969-10
Client Matrix: Water

Date Sampled: 03/01/2018 1505
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6987.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1529			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1529				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	9.2	J	1.9	10
Benzene	0.42	J	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,2-Dichloroethene	0.42	J	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-008**

Lab Sample ID: 280-106969-10
Client Matrix: Water

Date Sampled: 03/01/2018 1505
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6987.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1529			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1529				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.33	J	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.77	J	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 127
Toluene-d8 (Surr)	94		80 - 125
4-Bromofluorobenzene (Surr)	87		78 - 120
Dibromofluoromethane (Surr)	96		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-009**

Lab Sample ID: 280-106969-11
Client Matrix: Water

Date Sampled: 03/01/2018 1545
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6988.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1548			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1548				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	6.8	J	1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	6.2		0.15	1.0
trans-1,2-Dichloroethene	2.4		0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-009**

Lab Sample ID: 280-106969-11
Client Matrix: Water

Date Sampled: 03/01/2018 1545
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6988.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1548			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1548				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	11		0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	104		70 - 127
Toluene-d8 (Surr)	94		80 - 125
4-Bromofluorobenzene (Surr)	91		78 - 120
Dibromofluoromethane (Surr)	101		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-010**

Lab Sample ID: 280-106969-12
Client Matrix: Water

Date Sampled: 03/01/2018 0935
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6989.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1607			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1607				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	8.7	J	1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.65	J	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.70	J	0.15	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	2.2		0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-010**

Lab Sample ID: 280-106969-12
Client Matrix: Water

Date Sampled: 03/01/2018 0935
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6989.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1607			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1607				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.30	J	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	99		70 - 127
Toluene-d8 (Surr)	91		80 - 125
4-Bromofluorobenzene (Surr)	88		78 - 120
Dibromofluoromethane (Surr)	97		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-013**

Lab Sample ID: 280-106969-13
Client Matrix: Water

Date Sampled: 03/01/2018 1030
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6990.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1626			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1626				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Acetone	110		1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	140		2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.98	J	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	5.5		0.15	1.0
trans-1,2-Dichloroethene	0.42	J	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	1.1		0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	2.7	J	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0
n-Propylbenzene	0.16	U	0.16	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Client Sample ID: **PIN20-01.1802001-013**

Lab Sample ID: 280-106969-13
Client Matrix: Water

Date Sampled: 03/01/2018 1030
Date Received: 03/03/2018 0830

8260B Volatile Organic Compounds (GC/MS)

Analysis Method:	8260B	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	R6990.D
Dilution:	1.0			Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1626			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1626				

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	118		70 - 127
Toluene-d8 (Surr)	94		80 - 125
4-Bromofluorobenzene (Surr)	104		78 - 120
Dibromofluoromethane (Surr)	102		77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Surrogate Recovery Report

8260B Volatile Organic Compounds (GC/MS)

Client Matrix: Water

Lab Sample ID	Client Sample ID	DBFM %Rec	DCA %Rec	TOL %Rec	BFB %Rec
280-106969-1	PIN20-01.1802001.011	90	86	91	85
280-106969-2	PIN20-01.1802001.012	97	97	95	88
280-106969-3	PIN20-01.1802001.014	94	94	94	86
280-106969-4	PIN20-01.1802001-002	94	94	93	87
280-106969-5	PIN20-01.1802001-003	96	95	91	87
280-106969-6	PIN20-01.1802001-004	98	97	93	88
280-106969-7	PIN20-01.1802001-005	100	102	96	91
280-106969-8	PIN20-01.1802001-006	93	97	89	82
280-106969-8 DL	PIN20-01.1802001-006 DL	106	117	93	89
280-106969-9	PIN20-01.1802001-007	100	100	98	89
280-106969-10	PIN20-01.1802001-008	96	97	94	87
280-106969-11	PIN20-01.1802001-009	101	104	94	91
280-106969-12	PIN20-01.1802001-010	97	99	91	88
280-106969-13	PIN20-01.1802001-013	102	118	94	104
MB 280-407040/6		92	90	98	89
LCS 280-407040/4		94	89	97	90
280-106969-1 MS	PIN20-01.1802001.011 MS	94	92	93	85
280-106969-1 MSD	PIN20-01.1802001.011 MSD	94	91	92	84

Surrogate	Acceptance Limits
DBFM = Dibromofluoromethane (Surr)	77-120
DCA = 1,2-Dichloroethane-d4 (Surr)	70-127
TOL = Toluene-d8 (Surr)	80-125
BFB = 4-Bromofluorobenzene (Surr)	78-120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Method Blank - Batch: 280-407040

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 280-407040/6	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	R6970.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 0951	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 0951				
Leach Date:	N/A				

Analyte	Result	Qual	DL	LOQ
Acetone	1.9	U	1.9	10
Benzene	0.16	U	0.16	1.0
Bromobenzene	0.17	U	0.17	1.0
Bromochloromethane	0.10	U	0.10	1.0
Bromodichloromethane	0.17	U	0.17	1.0
Bromoform	0.19	U	0.19	1.0
Bromomethane	0.21	U	0.21	1.0
2-Butanone (MEK)	2.0	U	2.0	5.0
n-Butylbenzene	0.32	U	0.32	1.0
sec-Butylbenzene	0.17	U	0.17	1.0
tert-Butylbenzene	0.16	U	0.16	1.0
Carbon disulfide	0.45	U	0.45	1.0
Carbon tetrachloride	0.19	U	0.19	1.0
Chlorobenzene	0.17	U	0.17	1.0
Dibromochloromethane	0.17	U	0.17	1.0
Chloroethane	0.41	U	0.41	1.0
Chloroform	0.16	U	0.16	1.0
Chloromethane	0.30	U	0.30	1.0
2-Chlorotoluene	0.17	U	0.17	1.0
4-Chlorotoluene	0.21	U	0.21	1.0
1,2-Dibromo-3-Chloropropane	0.47	U	0.47	1.0
Dibromomethane	0.17	U	0.17	1.0
1,2-Dichlorobenzene	0.15	U	0.15	1.0
1,3-Dichlorobenzene	0.13	U	0.13	1.0
1,4-Dichlorobenzene	0.16	U	0.16	1.0
Dichlorodifluoromethane	0.31	U	0.31	1.0
1,1-Dichloroethane	0.22	U	0.22	1.0
1,2-Dichloroethane	0.13	U	0.13	1.0
cis-1,2-Dichloroethene	0.15	U	0.15	1.0
trans-1,2-Dichloroethene	0.15	U	0.15	1.0
1,1-Dichloroethene	0.23	U	0.23	1.0
1,2-Dichloropropane	0.18	U	0.18	1.0
1,3-Dichloropropane	0.22	U	0.22	1.0
2,2-Dichloropropane	0.18	U	0.18	1.0
cis-1,3-Dichloropropene	0.16	U	0.16	1.0
trans-1,3-Dichloropropene	0.19	U	0.19	1.0
1,1-Dichloropropene	0.19	U	0.19	1.0
Ethylbenzene	0.16	U	0.16	1.0
Hexachlorobutadiene	0.36	U	0.36	1.0
2-Hexanone	1.7	U	1.7	5.0
Isopropylbenzene	0.19	U	0.19	1.0
4-Isopropyltoluene	0.20	U	0.20	1.0
Methylene Chloride	0.32	U	0.32	1.0
4-Methyl-2-pentanone	0.98	U	0.98	5.0
Naphthalene	0.22	U	0.22	1.0

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Method Blank - Batch: 280-407040

Method: 8260B
Preparation: 5030B

Lab Sample ID:	MB 280-407040/6	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	R6970.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 0951	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 0951				
Leach Date:	N/A				

Analyte	Result	Qual	DL	LOQ
n-Propylbenzene	0.16	U	0.16	1.0
Styrene	0.17	U	0.17	1.0
1,1,1,2-Tetrachloroethane	0.21	U	0.21	1.0
1,1,2,2-Tetrachloroethane	0.21	U	0.21	1.0
Tetrachloroethene	0.20	U	0.20	1.0
Toluene	0.17	U	0.17	1.0
1,2,3-Trichlorobenzene	0.21	U	0.21	1.0
1,2,4-Trichlorobenzene	0.21	U	0.21	1.0
1,1,1-Trichloroethane	0.16	U	0.16	1.0
1,1,2-Trichloroethane	0.27	U	0.27	1.0
Trichloroethene	0.16	U	0.16	1.0
Trichlorofluoromethane	0.29	U	0.29	1.0
1,2,3-Trichloropropane	0.33	U	0.33	1.0
1,2,4-Trimethylbenzene	0.15	U	0.15	1.0
1,3,5-Trimethylbenzene	0.16	U	0.16	1.0
Vinyl chloride	0.10	U	0.10	1.0
Xylenes, Total	0.19	U	0.19	1.0
1,2-Dibromoethane	0.18	U	0.18	1.0

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	90	70 - 127
Toluene-d8 (Surr)	98	80 - 125
4-Bromofluorobenzene (Surr)	89	78 - 120
Dibromofluoromethane (Surr)	92	77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Lab Control Sample - Batch: 280-407040

Method: 8260B
Preparation: 5030B

Lab Sample ID:	LCS 280-407040/4	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	R6969.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 0907	Units:	ug/L	Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 0907				
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Benzene	5.00	4.27	85	65 - 135	
Bromodichloromethane	5.00	4.44	89	65 - 135	
Carbon tetrachloride	5.00	4.83	97	65 - 135	
Chlorobenzene	5.00	4.21	84	65 - 135	
Chloroform	5.00	4.35	87	65 - 135	
1,3-Dichlorobenzene	5.00	4.16	83	65 - 135	
1,1-Dichloroethane	5.00	4.38	88	65 - 135	
trans-1,2-Dichloroethene	5.00	4.33	87	65 - 135	
1,1-Dichloroethene	5.00	4.06	81	65 - 136	
1,2-Dichloropropane	5.00	4.36	87	64 - 135	
Ethylbenzene	5.00	4.06	81	65 - 135	
Methylene Chloride	5.00	4.26	85	54 - 141	
Tetrachloroethene	5.00	4.10	82	65 - 135	
Toluene	5.00	4.25	85	65 - 135	
1,1,1-Trichloroethane	5.00	4.49	90	65 - 135	
Trichloroethene	5.00	4.16	83	65 - 135	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	89	70 - 127
Toluene-d8 (Surr)	97	80 - 125
4-Bromofluorobenzene (Surr)	90	78 - 120
Dibromofluoromethane (Surr)	94	77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-407040

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	280-106969-1	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	R6978.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1236			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1236				20 mL
Leach Date:	N/A				

MSD Lab Sample ID:	280-106969-1	Analysis Batch:	280-407040	Instrument ID:	VMS_R1
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	R6979.D
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	20 mL
Analysis Date:	03/07/2018 1255			Final Weight/Volume:	20 mL
Prep Date:	03/07/2018 1255				20 mL
Leach Date:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Benzene	81	82	65 - 135	1	20		
Bromodichloromethane	89	92	65 - 135	3	20		
Carbon tetrachloride	103	99	65 - 135	4	21		
Chlorobenzene	81	82	65 - 135	1	20		
Chloroform	85	86	65 - 135	0	20		
1,3-Dichlorobenzene	80	81	65 - 135	2	20		
1,1-Dichloroethane	83	84	65 - 135	1	21		
trans-1,2-Dichloroethene	84	83	65 - 135	2	24		
1,1-Dichloroethene	80	76	65 - 136	4	20		
1,2-Dichloropropane	81	83	64 - 135	2	20		
Ethylbenzene	80	80	65 - 135	1	20		
Methylene Chloride	77	79	54 - 141	3	26		
Tetrachloroethene	82	80	65 - 135	3	20		
Toluene	82	84	65 - 135	2	20		
1,1,1-Trichloroethane	94	92	65 - 135	3	20		
Trichloroethene	82	82	65 - 135	0	20		

Surrogate	MS % Rec	MSD % Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	92	91	70 - 127
Toluene-d8 (Surr)	93	92	80 - 125
4-Bromofluorobenzene (Surr)	85	84	78 - 120
Dibromofluoromethane (Surr)	94	94	77 - 120

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 280-407040

Method: 8260B
Preparation: 5030B

MS Lab Sample ID:	280-106969-1	Units: ug/L		MSD Lab Sample ID:	280-106969-1
Client Matrix:	Water			Client Matrix:	Water
Dilution:	1.0			Dilution:	1.0
Analysis Date:	03/07/2018 1236			Analysis Date:	03/07/2018 1255
Prep Date:	03/07/2018 1236			Prep Date:	03/07/2018 1255
Leach Date:	N/A			Leach Date:	N/A

Analyte	Sample Result/Qual		MS Spike Amount	MSD Spike Amount	MS Result/Qual	MSD Result/Qual
Benzene	0.16	U	5.00	5.00	4.05	4.08
Bromodichloromethane	0.17	U	5.00	5.00	4.45	4.58
Carbon tetrachloride	0.19	U	5.00	5.00	5.14	4.94
Chlorobenzene	0.17	U	5.00	5.00	4.07	4.10
Chloroform	0.16	U	5.00	5.00	4.26	4.28
1,3-Dichlorobenzene	0.13	U	5.00	5.00	3.98	4.07
1,1-Dichloroethane	0.22	U	5.00	5.00	4.16	4.19
trans-1,2-Dichloroethene	0.17	J	5.00	5.00	4.39	4.32
1,1-Dichloroethene	0.23	U	5.00	5.00	3.99	3.82
1,2-Dichloropropane	0.18	U	5.00	5.00	4.07	4.14
Ethylbenzene	0.16	U	5.00	5.00	4.00	4.02
Methylene Chloride	0.32	U	5.00	5.00	3.84	3.94
Tetrachloroethene	0.20	U	5.00	5.00	4.12	4.02
Toluene	0.17	U	5.00	5.00	4.12	4.19
1,1,1-Trichloroethane	0.16	U	5.00	5.00	4.70	4.59
Trichloroethene	0.16	U	5.00	5.00	4.12	4.11

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
Sdg Number: PIN20-01.1802001

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Analysis Batch:280-407040					
LCS 280-407040/4	Lab Control Sample	T	Water	8260B	
MB 280-407040/6	Method Blank	T	Water	8260B	
280-106969-1	PIN20-01.1802001.011	T	Water	8260B	
280-106969-1MS	Matrix Spike	T	Water	8260B	
280-106969-1MSD	Matrix Spike Duplicate	T	Water	8260B	
280-106969-2	PIN20-01.1802001.012	T	Water	8260B	
280-106969-3	PIN20-01.1802001.014	T	Water	8260B	
280-106969-4	PIN20-01.1802001-002	T	Water	8260B	
280-106969-5	PIN20-01.1802001-003	T	Water	8260B	
280-106969-6	PIN20-01.1802001-004	T	Water	8260B	
280-106969-7	PIN20-01.1802001-005	T	Water	8260B	
280-106969-8	PIN20-01.1802001-006	T	Water	8260B	
280-106969-8DL	PIN20-01.1802001-006	T	Water	8260B	
280-106969-9	PIN20-01.1802001-007	T	Water	8260B	
280-106969-10	PIN20-01.1802001-008	T	Water	8260B	
280-106969-11	PIN20-01.1802001-009	T	Water	8260B	
280-106969-12	PIN20-01.1802001-010	T	Water	8260B	
280-106969-13	PIN20-01.1802001-013	T	Water	8260B	

Report Basis
T = Total

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
SDG: PIN20-01.1802001

Laboratory Chronicle

Lab ID: 280-106969-1 **Client ID: PIN20-01.1802001.011**

Sample Date/Time: 03/01/2018 12:00 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-1		280-407040		03/07/2018 10:10	1	TAL DEN	MD
A:8260B	280-106969-A-1		280-407040		03/07/2018 10:10	1	TAL DEN	MD

Lab ID: 280-106969-1 **Client ID: PIN20-01.1802001.011**

Sample Date/Time: 03/01/2018 12:00 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-B-1 MS		280-407040		03/07/2018 12:36	1	TAL DEN	MD
A:8260B	280-106969-B-1 MS		280-407040		03/07/2018 12:36	1	TAL DEN	MD

Lab ID: 280-106969-1 **Client ID: PIN20-01.1802001.011**

Sample Date/Time: 03/01/2018 12:00 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-B-1 MSD		280-407040		03/07/2018 12:55	1	TAL DEN	MD
A:8260B	280-106969-B-1 MSD		280-407040		03/07/2018 12:55	1	TAL DEN	MD

Lab ID: 280-106969-2 **Client ID: PIN20-01.1802001.012**

Sample Date/Time: 03/01/2018 08:00 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-2		280-407040		03/07/2018 13:15	1	TAL DEN	MD
A:8260B	280-106969-A-2		280-407040		03/07/2018 13:15	1	TAL DEN	MD

Lab ID: 280-106969-3 **Client ID: PIN20-01.1802001.014**

Sample Date/Time: 03/01/2018 12:05 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-3		280-407040		03/07/2018 13:34	1	TAL DEN	MD
A:8260B	280-106969-A-3		280-407040		03/07/2018 13:34	1	TAL DEN	MD

Lab ID: 280-106969-4 **Client ID: PIN20-01.1802001-002**

Sample Date/Time: 03/01/2018 13:15 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-4		280-407040		03/07/2018 13:53	1	TAL DEN	MD
A:8260B	280-106969-A-4		280-407040		03/07/2018 13:53	1	TAL DEN	MD

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
SDG: PIN20-01.1802001

Laboratory Chronicle

Lab ID: 280-106969-5 **Client ID: PIN20-01.1802001-003**

Sample Date/Time: 03/01/2018 11:20 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-5		280-407040		03/07/2018 14:12	1	TAL DEN	MD
A:8260B	280-106969-A-5		280-407040		03/07/2018 14:12	1	TAL DEN	MD

Lab ID: 280-106969-6 **Client ID: PIN20-01.1802001-004**

Sample Date/Time: 03/01/2018 12:30 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-6		280-407040		03/07/2018 14:31	1	TAL DEN	MD
A:8260B	280-106969-A-6		280-407040		03/07/2018 14:31	1	TAL DEN	MD

Lab ID: 280-106969-7 **Client ID: PIN20-01.1802001-005**

Sample Date/Time: 03/01/2018 08:30 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-7		280-407040		03/07/2018 14:50	1	TAL DEN	MD
A:8260B	280-106969-A-7		280-407040		03/07/2018 14:50	1	TAL DEN	MD

Lab ID: 280-106969-8 **Client ID: PIN20-01.1802001-006**

Sample Date/Time: 03/01/2018 16:45 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-8		280-407040		03/07/2018 10:29	1	TAL DEN	MD
A:8260B	280-106969-A-8		280-407040		03/07/2018 10:29	1	TAL DEN	MD
P:5030B	280-106969-A-8	DL	280-407040		03/07/2018 16:46	4	TAL DEN	MD
A:8260B	280-106969-A-8	DL	280-407040		03/07/2018 16:46	4	TAL DEN	MD

Lab ID: 280-106969-9 **Client ID: PIN20-01.1802001-007**

Sample Date/Time: 03/01/2018 16:30 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-9		280-407040		03/07/2018 15:10	1	TAL DEN	MD
A:8260B	280-106969-A-9		280-407040		03/07/2018 15:10	1	TAL DEN	MD

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
SDG: PIN20-01.1802001

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Lab ID: 280-106969-10 **Client ID: PIN20-01.1802001-008**

Sample Date/Time: 03/01/2018 15:05 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-10		280-407040		03/07/2018 15:29	1	TAL DEN	MD
A:8260B	280-106969-A-10		280-407040		03/07/2018 15:29	1	TAL DEN	MD

Lab ID: 280-106969-11 **Client ID: PIN20-01.1802001-009**

Sample Date/Time: 03/01/2018 15:45 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-B-11		280-407040		03/07/2018 15:48	1	TAL DEN	MD
A:8260B	280-106969-B-11		280-407040		03/07/2018 15:48	1	TAL DEN	MD

Lab ID: 280-106969-12 **Client ID: PIN20-01.1802001-010**

Sample Date/Time: 03/01/2018 09:35 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-12		280-407040		03/07/2018 16:07	1	TAL DEN	MD
A:8260B	280-106969-A-12		280-407040		03/07/2018 16:07	1	TAL DEN	MD

Lab ID: 280-106969-13 **Client ID: PIN20-01.1802001-013**

Sample Date/Time: 03/01/2018 10:30 Received Date/Time: 03/03/2018 08:30

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	280-106969-A-13		280-407040		03/07/2018 16:26	1	TAL DEN	MD
A:8260B	280-106969-A-13		280-407040		03/07/2018 16:26	1	TAL DEN	MD

Lab ID: MB **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	MB 280-407040/6		280-407040		03/07/2018 09:51	1	TAL DEN	MD
A:8260B	MB 280-407040/6		280-407040		03/07/2018 09:51	1	TAL DEN	MD

Lab ID: LCS **Client ID: N/A**

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:5030B	LCS 280-407040/4		280-407040		03/07/2018 09:07	1	TAL DEN	MD
A:8260B	LCS 280-407040/4		280-407040		03/07/2018 09:07	1	TAL DEN	MD

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
SDG: PIN20-01.1802001

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Lab References:
TAL DEN = TestAmerica Denver

Shipping and Receiving Documents

Chain of Custody / Sample Submittal Form

NAVARRO

Task Code: PIN20-01.1802001 | COC ID: PIN20-01.1802001-COC.1 | TURNAROUND TIME: 28 Days

PROJECT INFORMATION		LABORATORY		SAMPLING / SHIPPING	
Facility Name:	Pinellas 4.5 Acre Site	Lab Name:	TestAmerica Denver	Shipping Company:	
Project Number:	1.101.1.06.509.2.01	Address:	4955 Yarrow Street	Tracking Number:	
Project Name:	Pinellas 4.5 Acre Site	City:	Arvada State: CO	Cooler Count:	
		Postal Code:	80002	Date Shipped:	03/02/2018
		Phone Number:	303-736-0100	Sampled by:	Baer, Tigar, Graham, Caballero
		PO Number:	LMCP6283	Sampler 2:	

SAMPLE DETAILS — ANALYSIS REQUESTED (Filtered: F-Field, L-Lab, FL-Field & Lab, N-None)

Sample ID	Location	Matrix	Date	Time (24hr)	G=Grab C=Comp	QC	# of Cont	VOAs...	GLASS 40 ML	N	4 C, HCl
PIN20-01.1802001.011	2860	GW	03/01/2018	12:00	G		3	3	N		
PIN20-01.1802001.012	2861	WATER	03/01/2018	08:00	G		2	2	N		
PIN20-01.1802001.014	2862	GW	03/01/2018	12:05	G		3	3	N		
PIN20-01.1802001-002	M015	GW	03/01/2018	13:15	G		3	3	N		
PIN20-01.1802001-003	M053	GW	03/01/2018	11:20	G		3	3	N		
PIN20-01.1802001-004	M056	GW	03/01/2018	12:30	G		3	3	N		
PIN20-01.1802001-005	M058	GW	03/01/2018	08:30	G		3	3	N		
PIN20-01.1802001-006	M059	GW	03/01/2018	16:45	G		3	3	N		
PIN20-01.1802001-007	M067	GW	03/01/2018	16:30	G		3	3	N		
PIN20-01.1802001-008	M068	GW	03/01/2018	15:05	G		3	3	N		
PIN20-01.1802001-009	M069	GW	03/01/2018	15:45	G		3	3	N		
PIN20-01.1802001-010	M18D	GW	03/01/2018	09:35	G		3	3	N		
PIN20-01.1802001-013	M057	GW	03/01/2018	10:30	G		3	3	N		

280-106969 Chain of Custody

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ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	[signature]	3/2/18 0900	[signature]	3-2-18 1325
	[signature]	3-2-18 @ 1700	[signature] TA-Den	3-3-18 0830

0.5 ERHS to.1 Transfer

RP 3-3-18

Login Sample Receipt Checklist

Client: Navarro Research and Engineering, Inc

Job Number: 280-106969-1
SDG Number: PIN20-01.1802001

Login Number: 106969
List Number: 1
Creator: Pottruff, Reed W

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	70
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	