4.5 Acre Site Second Quarterly Sampling Report, Pinellas County, Florida, Site

This progress report documents the second closure-monitoring sampling event for the 4.5 Acre Site. On May 31, 2018, the Florida Department of Environmental Protection (FDEP) approved a quarterly closure-monitoring sampling frequency. The second event took place on September 6-7, 2018. Groundwater samples were collected from the 11 onsite monitoring wells for the analysis of volatile organic compounds (VOCs). All samples were collected in accordance with FDEP procedures with the exception that a full set of field parameters (pH, specific conductance, temperature, oxidation-reduction potential, and dissolved oxygen) could not be measured in 10 of the 11 wells due to interference from soybean oil injected into the surficial aquifer during three bioinjection events from 2010 through 2016. For these 10 wells, samples were collected when water-level, turbidity, and purge-volume criteria were met. The groundwater sampling and field instrument calibration logs for the September event are provided in Attachment 1.

Samples were submitted to TestAmerica Laboratories in Denver, Colorado, for the analysis of VOCs using U.S. Environmental Protection Agency SW-846 method 8260B. This analytical method includes the five contaminants of potential concern (COPCs) for the 4.5 Acre Site: trichloroethene (TCE), *cis*-1,2-dichloroethene (*cis*-1,2-DCE), *trans*-1,2-dichloroethene (*trans*-1,2-DCE), vinyl chloride (VC), and benzene. The COPC concentrations are presented in Table 1. The only well to have a COPC that exceeded its cleanup target level was 20-M069, which had a VC concentration of 2.5 micrograms per liter. Figure 1 shows the VC concentrations for the 11 wells in September 2018.

The results from TestAmerica were checked for quality assurance/quality control through laboratory duplicates and blanks, two field duplicates, and one trip blank. In addition, a data-validation software module for identifying and tracking anomalous groundwater data was used to analyze results that fall outside of historical minimum or maximum values. The analytical data from the 11 monitoring wells are acceptable, representing the current groundwater conditions at these locations. All but one of the vinyl chloride detections are J qualified, indicating that those concentrations are estimated values that fall between the contract-required quantitation limit and the method detection limit.

The compounds acetone and 2-butanone, which are not site COPCs, were again detected in several samples. Both of these compounds are typical byproducts following bioinjections, and their concentrations are declining as expected. These two compounds will continue to be monitored in future sampling events.

On November 8, 2018, FDEP approved increasing the sampling frequency from quarterly to monthly. Therefore, DOE proceeded with conducting the third sampling event (i.e., the first monthly event) in late November. The fourth event is scheduled for late December. DOE will provide FDEP with a progress report following each monthly sampling event.

Table 1. COPC Concentrations at the 4.5 Acre Site, September 2018

Location	Screen Depth (feet)	Date Sampled	TCE	*cis*-1,2-DCE	*trans*-1,2-DCE	Vinyl chloride	Benzene
Cleanup Target Level (µg/L)			**3**	**70**	**100**	**1**	**1**
M001	20-25	9/6/2018	<0.16	0.25J	0.91J	0.83J	0.80J
M015	20.8-25.8	9/6/2018	<0.16	0.28J	<0.15	0.89J	<0.16
M053	20-30	9/7/2018	<0.16	2.5	<0.15	<0.10	<0.16
M056	19-29	9/7/2018	<0.16	2.8	<0.15	<0.10	<0.16
M057	20-30	9/7/2018	<0.16	3.0	0.25J	<0.10	<0.16
M058	18-28	9/6/2018	<0.16	1.4	<0.15	<0.10	<0.16
M059	19-29	9/6/2018	<0.16	0.22J	<0.15	<0.10	0.46J
M067	10-20	9/6/2018	<0.16	0.53J	0.23J	0.75J	<0.16
M068	20-30	9/6/2018	<0.16	<0.15	0.49J	<0.10	0.39J
M069	10-20	9/6/2018	<0.16	3.4	1.6	2.5	<0.16
M18D	20-30	9/7/2018	<0.16	0.81J	<0.15	<0.10	<0.16

Note:
Concentrations shown in micrograms per liter (µg/L).
Vinyl chloride values of <0.10 are considered non-detect.

Abbreviation:
J = estimated value

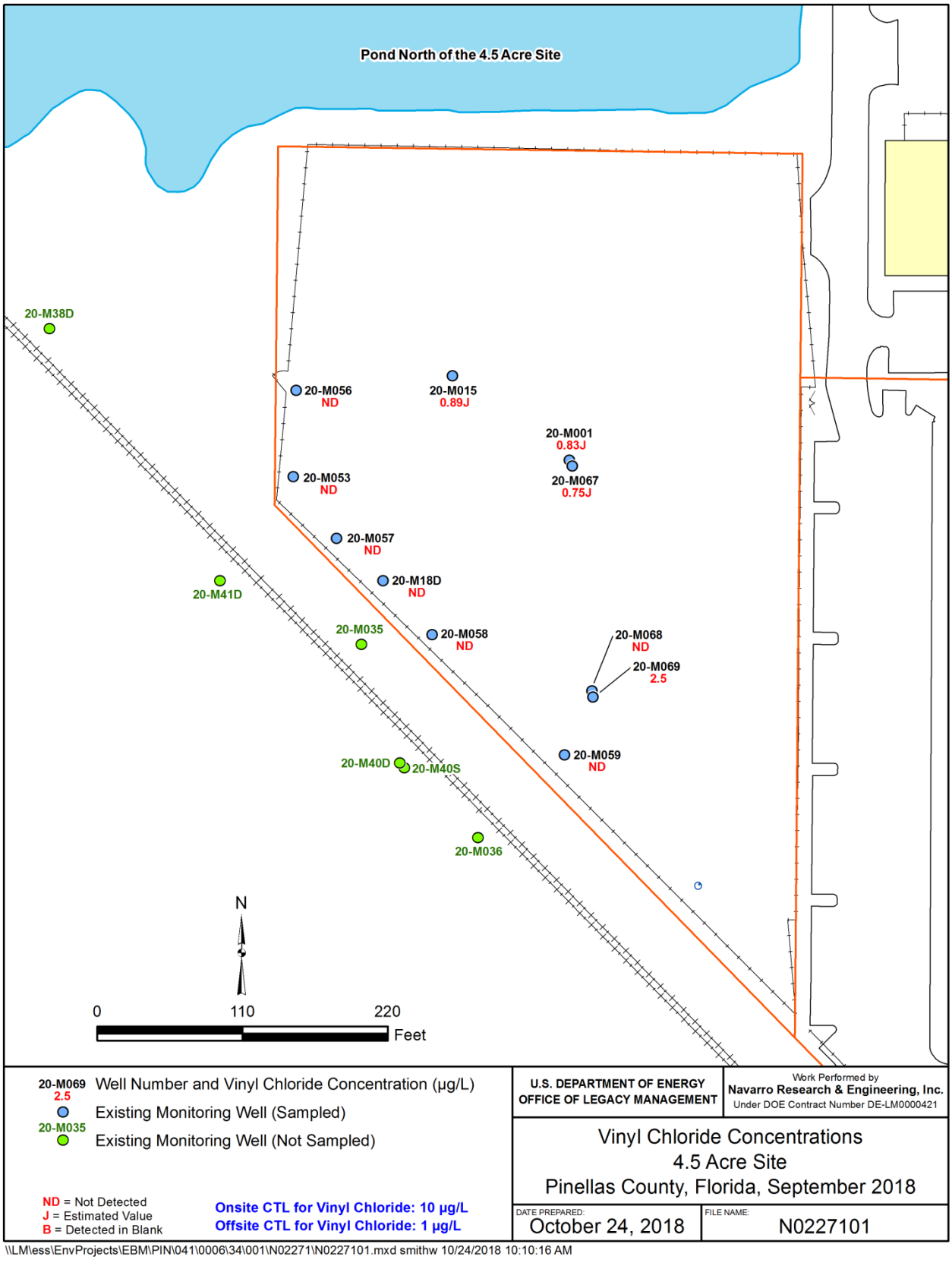

Figure 1. Vinyl Chloride Concentrations at the 4.5 Acre Site, September 2018

Attachment 1

Field Logs

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M001	Top of Screen	20
Project Code	1.101.1.06.509.2.01	Bottom of Screen	25
Project	Pinellas Monitoring	Total Depth	25
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	clear	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	10:37	Estimated Water Level Range	1.8 - 5.51
Water Level (ft) TOC	1.52	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	25	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)	25.83	Calculated Purge Volume	0.24
WL Measurement Date	09/06/2018		

Purge Information

Purge Start Time	10:39	Overall Flow Rate	77
Purge Start Date	09/06/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
10:51	0.8	65							396	734	2.50
10:54	1.2	120							109	200	2.90

Sample

Location Code	M001	Sample Time	11:00
Sample ID	PIN20-01.1809003-001	Sample Date	09/06/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	10:42	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/06/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			

Comments: No Sonde measurements per program directive PIN-SAP-2016-01. Color blackish. Odor foul. water is highly impacted. WL drops very quickly. Sampled per Florida DEP-SOP-001/01 FS 2212, sec 3.7.1: at least 2 volumes were purged (3.7.1.5) and one set of measurements was recorded (3.7.1.6). Very effervescent.Bubbles in vial.

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M015	Top of Screen	20.8
Project Code	1.101.1.06.509.2.01	Bottom of Screen	25.8
Project	Pinellas Monitoring	Total Depth	
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	overcast	Air Temperature (°F)	80 to 90
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	13:20	Estimated Water Level Range	0.6 - 4.44
Water Level (ft) TOC	1.15	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	26	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)	26.69	Calculated Purge Volume	0.25
WL Measurement Date	09/06/2018		

Purge Information

Purge Start Time	13:22	Overall Flow Rate	150
Purge Start Date	09/06/2018	Purging stability met?	

Field Results

Add | Remove | Refresh | Unlock | Autofit | Analytes | Show | YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
13:25	0.8	267							25.9	180	1.7
13:28	1.2	133							12.3	180	1.7
13:32	1.5	75							9.34	240	1.7
13:34	1.8	150							8.91	120	1.7

Sample

Location Code	M015	Sample Time	13:35
Sample ID	PIN20-01.1809003-002	Sample Date	09/06/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	13:33	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/06/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			
Comments	No Sonde measurements per program directive PIN-SAP-2016-01. blackish color; strong odor. very slight effervescent		

Field Results Extra

Add | Remove | Refresh | Unlock | Autofit | Analytes | Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ VOA-A-007, VOAs

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M053	Top of Screen	20
Project Code	1.101.1.06.509.2.01	Bottom of Screen	30
Project	Pinellas Monitoring	Total Depth	30
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	clear	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	07:51	Estimated Water Level Range	1.55 - 7.24
Water Level (ft) TOC	0.66	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	2
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	30	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.29
WL Measurement Date	09/07/2018		

Purge Information

Purge Start Time	07:52	Overall Flow Rate	112
Purge Start Date	09/07/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
07:56	0.4	96							152	251	0.85
08:04	1.3	105							47.3	514	0.85
08:10	2.0	127							29.5	330	0.85
08:13	2.5	146							22.4	205	0.85
08:19	3.1	102							18.0	353	0.85
08:22	3.4	107							16.1	169	0.85
08:25	3.7	113							16.5	160	0.85

Sample

Location Code	M053	Sample Time	08:30
Sample ID	PIN20-01.1809003-003	Sample Date	09/07/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	07:52	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/07/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			

Comments: No Sonde measurements per program directive PIN-SAP-2016-01. Color blackish. Odor foul. Effervescent.

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
▶ *VOA-_*							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M056	Top of Screen	19
Project Code	1.101.1.06.509.2.01	Bottom of Screen	29
Project	Pinellas Monitoring	Total Depth	29
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	clear	Air Temperature (°F)	80 to 90
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	09:57	Estimated Water Level Range	1.34 - 6.08
Water Level (ft) TOC	0.30	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	2
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	29	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.28
WL Measurement Date	09/07/2018		

Purge Information

Purge Start Time	10:01	Overall Flow Rate	127
Purge Start Date	09/07/2018	Purging stability met?	

Field Results

Add | Remove | Refresh | Unlock | Autofit | Analytes | Show | YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
10:06	0.7	119							25.2	354	0.38
10:18	2.1	118							19.8	709	0.38
10:20	2.4	133							18.6	135	0.38
10:23	2.8	192							16.8	125	0.38

Sample

Location Code	M056	Sample Time	10:25
Sample ID	PIN20-01.1809003-004	Sample Date	09/07/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	09:58	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/07/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			
Comments	No Sonde measurements per program directive PIN-SAP-2016-01. Color blackish. Odor foul. ashy flakes		

Field Results Extra

Add | Remove | Refresh | Unlock | Autofit | Analytes | Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ VOA-A-007, VOAs

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M057	Top of Screen	20
Project Code	1.101.1.06.509.2.01	Bottom of Screen	30
Project	Pinellas Monitoring	Total Depth	30
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	clear	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	08:05	Estimated Water Level Range	2.16 - 6.64
Water Level (ft) TOC	1.12	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	2
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	30	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.29
WL Measurement Date	09/07/2018		

Purge Information

Purge Start Time	08:10	Overall Flow Rate	86
Purge Start Date	09/07/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
08:36	2.4	92							43.1	1572	1.68
08:44	3.0	69							83.0	523	1.67
08:48	3.4	115							48.0	208	1.67
08:51	3.7	110							43.2	163	1.67
08:53	3.9	80							38.7	150	1.67
08:57	4.1	56							46.9	213	1.67
09:00	4.4	102							22.1	177	1.67
09:02	4.5	44							25.4	135	1.67
09:04	4.7	90							13.8	133	1.67
09:07	5.0	104							16.3	173	1.67
09:10	5.2	75							18.4	161	1.67

Sample

Location Code	M057	Sample Time	09:15
Sample ID	PIN20-01.1809003-013	Sample Date	09/07/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	08:11	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/07/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			

Comments: No Sonde measurements per program directive PIN-SAP-2016-01. Color blackish. Very foul odor. Heavily impacted. Ashy flakes. WL meter has difficulty reading WL because of greasy foamy layer on top. Purge bucket turned very dark black.

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
▶ *VOA-_*							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M058	Top of Screen	18
Project Code	1.101.1.06.509.2.01	Bottom of Screen	28
Project	Pinellas Monitoring	Total Depth	28
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	overcast	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	16:45	Estimated Water Level Range	3.17 - 6.71
Water Level (ft) TOC	0.90	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	2
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	28	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.27
WL Measurement Date	09/06/2018		

Purge Information

Purge Start Time	16:50	Overall Flow Rate	80
Purge Start Date	09/06/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
17:24	2.7	78							19.8	2067	0.98
17:27	3.0	117							10.8	154	0.98
17:29	3.2	69							9.48	173	0.98

Sample

Location Code	M058	Sample Time	17:35
Sample ID	PIN20-01.1809003-005	Sample Date	09/06/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristaltic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	16:43	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/06/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			
Comments	No Sonde measurements per program directive PIN-SAP-2016-01. Color blackish. Odor foul. Ashy flakes.		

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ VOA-A-007, VOAs

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M059	Top of Screen	19
Project Code	1.101.1.06.509.2.01	Bottom of Screen	29
Project	Pinellas Monitoring	Total Depth	29
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	overcast	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	16:30	Estimated Water Level Range	2.23 - 5.51
Water Level (ft) TOC	1.14	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	2
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	29	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.28
WL Measurement Date	09/06/2018		

Purge Information

Purge Start Time	16:40	Overall Flow Rate	126
Purge Start Date	09/06/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/...	mg/L	%	s.u.	mV	NTU	s	ft
16:50	1.6	149							134	643	2.8
16:54	2.0	98							87.5	244	2.93
16:56	2.3	144							99.3	125	2.95
16:59	2.5	89							90.0	135	2.93
17:01	2.7	85							95.3	142	2.96

Sample

Location Code	M059	Sample Time	17:05
Sample ID	PIN20-01.1809003-006	Sample Date	09/06/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	16:32	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/06/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			

Comments: No Sonde measurements per program directive PIN-SAP-2016-01.foul odor, blackish color; black and whitish particulates. Water is effervescent; 2ndary on turb

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ VOA-A-007, VOAs

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-...							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M067	Top of Screen	10
Project Code	1.101.1.06.509.2.01	Bottom of Screen	20
Project	Pinellas Monitoring	Total Depth	20
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	clear	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)		Estimated Water Level Range	0.6 - 4.01
Water Level (ft) TOC		Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	1
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	20	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.19
WL Measurement Date	09/06/2018		

Purge Information

Purge Start Time	09:47	Overall Flow Rate	127
Purge Start Date	09/06/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
09:56	0.9	99							228	548	0.8
10:09	3.0	155							135	814	0.8
10:12	3.3	126							138	143	0.8
10:14	3.6	114							125	158	0.8
10:17	4.0	140							104	172	0.8
10:20	4.3	114							98.6	158	0.8
10:23	4.6	96							96.6	188	0.8

Sample

Location Code	M067	Sample Time	10:30
Sample ID	PIN20-01.1809003-007	Sample Date	09/06/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	09:47	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/06/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			

Comments: No WL, foaming. No Sonde measurements per program directive PIN-SAP-2016-01. blackish color; foul odor. veryslight effervescent. 2ndary met for turb.2860 DUP.

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
▶ *VOA-_*							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M068	Top of Screen	20
Project Code	1.101.1.06.509.2.01	Bottom of Screen	30
Project	Pinellas Monitoring	Total Depth	30
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	rain	Air Temperature (°F)	80 to 90
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)		Estimated Water Level Range	0.41 - 3.34
Water Level (ft) TOC		Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	1
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	30	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0.15
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.44
WL Measurement Date	09/06/2018		

Purge Information

Purge Start Time	14:05	Overall Flow Rate	130
Purge Start Date	09/06/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
14:16	1.6	135	26.60	1156	1.59	19.8	6.26	-65.0	137	711	1.66
14:19	1.9	115	26.61	1152	1.56	19.4	6.27	-65.2	120	156	1.64
14:21	2.1	91	26.58	1138	1.51	18.9	6.29	-67.0	83.1	132	1.64
14:24	2.4	118	26.75	1140	1.54	19.3	6.30	-70.1	85.7	152	1.64
14:27	2.8	130	26.75	1133	1.54	19.3	6.30	-69.6	76.6	184	1.64
14:30	3.2	113	26.98	1120	1.57	19.8	6.31	-68.4	66.1	212	1.64
14:33	3.4	88	26.88	1113	1.56	19.6	6.31	-67.5	49.0	136	1.64
14:35	3.8	167	27.07	1158	1.61	20.3	6.30	-66.4	62.5	144	1.64
14:41	4.6	126	27.39	1151	1.67	21.2	6.32	-64.4	53.8	380	1.64
14:44	4.9	105	27.39	1138	1.70	21.6	6.33	-62.9	35.7	172	1.64
15:00	7.0	129	26.22	1070	1.76	21.9	6.30	-46.3	35.3	980	1.64
15:04	7.3	98	26.27	1062	1.80	22.4	6.29	-43.5	28.1	184	1.64
15:13	8.5	126	25.66	1174	2.15	26.4	6.29	-51.2	39.5	573	1.64
15:16	9.0	192	25.68	1163	1.93	23.8	6.29	-51.7	33.9	156	1.64
15:18	9.5	197	25.64	1138	1.87	23.0	6.30	-54.0	32.1	152	1.64
15:20	9.9	182	25.67	1146	1.88	23.1	6.30	-55.6	34.4	132	1.64

Sample

Location Code	M068	Sample Time	15:25
Sample ID	PIN20-01.1809003-008	Sample Date	09/06/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	13:59	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/06/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			

Comments: Water bubbled up; no initial WL. Color brownish. Odor mild, not especially foul. Small pressure; small surge. Turb & DO met 2ndary criteria, water is effervescent.

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M069	Top of Screen	10
Project Code	1.101.1.06.509.2.01	Bottom of Screen	20
Project	Pinellas Monitoring	Total Depth	20
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	clear	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	14:08	Estimated Water Level Range	0.5 - 3.41
Water Level (ft) TOC	1.0	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	1
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	20	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)		Calculated Purge Volume	0.19
WL Measurement Date	09/06/2018		

Purge Information

Purge Start Time	14:12	Overall Flow Rate	111
Purge Start Date	09/06/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/...	mg/L	%	s.u.	mV	NTU	s	ft
15:32	9.2	114							54.0	4834	1.12
15:38	9.7	88							58.6	339	1.12
15:40	10.0	112							47.3	161	1.12
15:43	10.2	82							48.3	146	1.12
15:45	10.4	85							47.4	142	1.12

Sample

Location Code	M069	Sample Time	15:50
Sample ID	PIN20-01.1809003-009	Sample Date	09/06/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristalitic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	14:01	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/06/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			

Comments: Water bubbled up; no initial WL. No Sonde measurements per program directive PIN-SAP-2016-01. Blackish color. VERY foul odor, 2ndary for Turb. 2863 Dup.

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ VOA-A-007, VOAs

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-...							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

U.S. DEPARTMENT OF ENERGY | Legacy Management

Ground Water

Location

Location ID	M18D	Top of Screen	20
Project Code	1.101.1.06.509.2.01	Bottom of Screen	30
Project	Pinellas Monitoring	Total Depth	30
Category	PIN Micropurge	Location Type	WL

Measurement Equipment

Multiparameter ID	SND09	Other	
Turbidimeter ID	TRB05	Datalogger Present?	No
Water Level ID		Datalogger Specific	
Alkalinity ID			

Weather

Precipitation	clear	Air Temperature (°F)	70 to 80
Wind	light		

Water Level and Purge Data

WL Measurement Time (24 hr)	08:55	Estimated Water Level Range	3.68 - 7.17
Water Level (ft) TOC	1.1	Measured Depth of Well (ft)	
Water Level Flag		Casing Diameter (in)	
Purge Calculation Method	Equipment Volume	Casing Volumes to Purge	0
Tubing Length (ft)	30	Drop Tubing Length (ft)	0
Tubing Diameter (in)	0.25	Drop Tubing Diameter (in)	0
Bladder Volume (L)		Flow Cell Volume (L)	0
Well Volume (calc)		Purge Volume Unit (L or gal)	L
Length of Water Column (ft) (calc)	31.52	Calculated Purge Volume	0.29
WL Measurement Date	09/07/2018		

Purge Information

Purge Start Time	08:56	Overall Flow Rate	159
Purge Start Date	09/07/2018	Purging stability met?	

Field Results

Add Remove Refresh | Unlock Autofit | Analytes Show YSI 6920

Time	Vol	FLOW	TEMP	SC	DO	%-do	PH	ORP	TURB	ET	DTW
Fraction	N	N	N	N	N	N	N	N	N	N	N
Unit	L	mL/min	C	umhos/_	mg/L	%	s.u.	mV	NTU	s	ft
09:34	6.0	156							12.9	2306	1.24
09:37	6.5	190							13.4	158	1.24
09:39	7.0	176							10.6	170	1.23

Sample

Location Code	M18D	Sample Time	09:45
Sample ID	PIN20-01.1809003-010	Sample Date	09/07/2018
Sample Type (F=Field Sample)	F	Sampling Equipment	Peristaltic Pump & Ded Tubing
Sample Matrix	GW	Measurement Method	Air Exclusion
Arrival Time (24 hr)	09:30	Storage: Ice in Cooler?	Yes
Sampler(s)	Gretchen Baer,Lauren Goodknight	Filtered Y/N	N
Operational Check Date/Time	09/07/2018 07:00 (24hr)	Number of Filters	
Start Depth		Filter Pore Size	
End Depth			
Comments	No Sonde measurements per program directive PIN-SAP-2016-01. Color OK. Odor foul.		

Field Results Extra

Add Remove Refresh | Unlock Autofit | Analytes Show

Time	ALK_VOL	Titrator	ALK	Phen ALK	Fld (Fe)II	Fld Tot Fe	CL-RESID
Fraction	N	N	N	N	N	N	N
Unit	mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Groundwater Form

QC Sample

QC Sample Location

Location ID	2860	Project Code	1.101.1.06.509.2.01
Location Type (QC)	QC	Project	Pinellas Monitoring

QC Samples

Sample Time (24 hr)	00:00	Sample Type (D, E, FB, TB)	D
Sample Date	09/06/2018	Matrix (GW, SW for Dup; WATER for Blank)	GW
Sample ID	PIN20-01.1809003-011	Filtered Y/N	N
Parent Sample ID (DUP samples only!)	PIN20-01.1809003-007	Filter Pore Size	
Sampler(s)	Gretchen Baer,Lauren Goodknight	Number of Filters	
Storage: Ice in Cooler?	Yes		
Comments	M067		
sample_class	FQ	composite_yn	N

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Field QC Sample Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

QC Sample

QC Sample Location

Location ID	2861	Project Code	1.101.1.06.509.2.01
Location Type (QC)	QC	Project	Pinellas Monitoring

QC Samples

Sample Time (24 hr)	08:00	Sample Type (D, E, FB, TB)	TB
Sample Date	09/06/2018	Matrix (GW, SW for Dup; WATER for Blank)	WATER
Sample ID	PIN20-01.1809003-012	Filtered Y/N	N
Parent Sample ID (DUP samples only!)		Filter Pore Size	
Sampler(s)	Gretchen Baer,Lauren Goodknight	Number of Filters	
Storage: Ice in Cooler?	Yes		
Comments			
sample_class	FQ	composite_yn	N

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
▸ *VOA-_*							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Field QC Sample Form

U.S. DEPARTMENT OF ENERGY | Legacy Management

QC Sample

QC Sample Location

Location ID	2863	Project Code	1.101.1.06.509.2.01
Location Type (QC)	QC	Project	Pinellas Monitoring

QC Samples

Sample Time (24 hr)	00:00	Sample Type (D, E, FB, TB)	D
Sample Date	09/06/2018	Matrix (GW, SW for Dup; WATER for Blank)	GW
Sample ID	PIN20-01.1809003-015	Filtered Y/N	N
Parent Sample ID (DUP samples only!)	PIN20-01.1809003-009	Filter Pore Size	
Sampler(s)	Gretchen Baer,Lauren Goodknight	Number of Filters	
Storage: Ice in Cooler?	Yes		
Comments	M069		
sample_class	FQ	composite_yn	N

Lab COC & Analysis

Lab: STD

☑ **VOA-A-007, VOAs**

MAG	Desc	Container Code	Number of containers	Filtered	Preservative	Container Description	Barcode
VOA-_							
	VO...	GLASS 40 ML	3		4 C, HCl	40 mL glass	
		Please select					

Field QC Sample Form

Turbidity Calibration Worksheet

Name: Tigar
Date: 8-21-18

Instrument ID	TRB02	TRB05						
Cal Stds Lot # (on lid)	A8026	"						
Cal Stds Exp Date	4/2019	"						
Old LOW range value	5.59	5.24						
Low range readings	5.25 5.60 5.43 5.57	5.29 5.45 5.51						
NEW assigned value	5.46	5.42						
Old MED range value	61.6	60.4						
Medium range readings	59.0 58.1 58.7	59.6 61.5 58.1						
NEW assigned value	58.6	59.7						
Old HIGH range value	694	545						
High range readings	706 704 698	549 551 547						
NEW assigned value	703	549						

Model **2100P** reminder: DON'T SHAKE OR INVERT THE "0" STANDARD. Remove the "0" standard and SHAKE the other 3 vials for 2 minutes. Let them sit 5 min before using. Press "CAL" and read the 4 vials as prompted. After the 4th vial, you must Press "CAL" again to save the calibration!

Model **2100Q** reminder: A "0" standard is NOT used. SHAKE the vials for 2 minutes. Let them sit 5 min before using. Push the cal button and read the 3 vials as prompted. Push Done, then push Store. You'll be prompted to Verify Cal. (Use the 10 NTU vial for this.)

PINELLAS YSI Calibration Worksheet

Date 8-21-18
Time 1500
YSI ID SND09
Calibrated by ST

Specific Conductance Calibration

Standard used (µmhos/cm or µS/cm)	999
Pre-cal Reading (mS/cm)	~~986~~ 986
Cond Cell Constant *Range = 4.5 to 5.5*	5.0

pH Calibration (Calibrate with the pH 7 buffer first)

Buffer pH	Temp (°C)	mV	Range (mV)	Pre-cal reading	Calibration value	Span	Range (mV)
4	23.4	A= 157.1	+127 to +227	4.03	4.00	A-B= 176.4	165-180
7	23.6	B= -19.3	-50 to +50	7.26	7.01	B-C= 176.9	165-180
10	23.3	C= -196.2	-227 to -127	10.03	10.02		

ORP Calibration

Temperature, °C	23.24
Calibration value	234.0
Pre-cal reading	217.3
ORP Offset *Range = -100 to +100*	25

Dissolved Oxygen Calibration

Time of Day	1545	Temp, °C	23.08
Atmospheric Pressure	648.7	Pre-Cal DO%	88.9
DO Membrane Changed?	yes	Pre-Cal DO mg/L	7.62
DO Charge *Range=25 to 75*	52.3	Post-Cal DO%	85.4
DO Gain *Range=0.7 to 1.5*	1.0	Post-Cal DO mg/L	7.31

Temperature Check

22.7
22.46

NIST Temp, °C	~~24.1~~
YSI Temp, °C *Range = ±0.5°C*	~~24.04~~
NIST ID #	170256346
NIST Cal Date	3/10/17
NIST Cal Due Date	3/10/19

ICVs (Initial Calibration Verifications)

Parameter	Known Value	Reading	Acceptance Range	Pass / Fail ?
pH	7.01	7.06	±0.2 units	Pass
Sp Cond ~100	99.3	99	±5%	Pass
Sp Cond ~10,000	9987	9827	±5%	Pass
Temp low	~~11.3~~	~~11.26~~	±0.5°C from NIST	Pass
Temp med	~~24.1~~	~~24.04~~		Pass
Temp high	~~33.2~~	~~33.16~~		Pass
D. O.	6.61	6.55	±0.3mg/L	Pass
ORP	234.0	237.4	±10%	Pass

Known	Read
15.3	15.52
22.7	22.46
43.1	42.91

For ICVs, calibration constants, or spans that fail, perform instrument maintenance as necessary and perform the calibration again.

	Manufacturer	Lot Number	Exp Date
pH 4 buffer	Fisher	176044	8/19
pH 7 buffer	Fisher	176363	9/19
pH 10 buffer	Fisher	175109	7/19
Sp Cond 100	Cole-Parmer	CC16729	12/15/18
Sp Cond 1,000	Cole-Parmer	CC16564	10/17/18
Sp Cond 10,000	Cole-Parmer	CC16646	11/10/18
Zobell Soln	Date Hydrated: 7/23/18	18A100520	1/24/23

PINELLAS Op-Check Worksheet

For Daily and End-of-Event Continuing Calibration Verifications (CCVs)

Date 9-5-18
Time 1415
YSI ID SND09
Initials ST

This is a:

- [x] Daily Check
- [ ] End-of-Event Check

	Standard	Reading	Acceptance Range	Pass / Fail ?
pH 1	6.99 @ 33.2 °C	6.97	±0.2	Pass
pH 2 (optional)	@ °C		±0.2	
Sp Cond 1	7800	7926	±5%	Pass
Sp Cond 2 (optional)			±5%	
ORP	220.6 @ 33.2 °C	219.7	±10%	Pass

Dissolved Oxygen Calibration #1

Time of Day	1435	Temp, °C	33.83
Atmospheric Pressure	646.2	Pre-Cal DO%	100.8
DO Membrane Changed?	N	Pre-Cal DO mg/L	7.14
DO Charge *Range=25 to 75*	41.0	Post-Cal DO%	85.0
DO Gain *Range=0.7 to 1.5*	0.9	Post-Cal DO mg/L	~~85.0~~ 6.02

Lcw 9-5-18 1437

Dissolved Oxygen Calibration ~~#2~~ #1

Time of Day	1440	Temp, °C	34.2
Atmospheric Pressure	467.4	Pre-Cal DO%	84.6
DO Membrane Changed?	N	Pre-Cal DO mg/L	5.96
DO Charge *Range=25 to 75*	41	Post-Cal DO%	101.0
DO Gain *Range=0.7 to 1.5*	1.1	Post-Cal DO mg/L	7.11

If you are only op-checking the DO, use the table below. Note that there are multiple columns to allow for multiple checks throughout the day. The water in Pinellas can foul DO membranes, requiring frequent sensor maintenance and recalibrations. Check the DO frequently to look for performance drift.

Dissolved Oxygen Op-Checks

Time of day						
Atmospheric Pressure						
Temperature, °C						
Known Saturation Value, mg/L *(From Table FS 2200-2 or FT 1500-1)*						
Saturation Value Reading, mg/L *(Acceptance Range is ± 0.3 mg/L of theoretical DO in H2O saturated air)*						
Pass / Fail?						

Turbidity 3-Point Check

Instrument: 05

Standard	Reading	Pass / Fail?
5.42	5.41	P
59.7	58.6	P
549	551	P

Turbidity Acceptance Ranges

0-10 ntu ±10%
10-40 ntu ±8%
41-100 ntu ±6.5%
>100 ntu ±5%

Temperature CCVs (End of Event only)

Parameter	NIST Value	Reading	Acceptance Range	Pass / Fail ?
Temp low			±0.5°C from NIST	
Temp med				
Temp high				

For CCVs that fail, perform instrument maintenance as necessary and perform the calibration again.

PINELLAS Op-Check Worksheet

For Daily and End-of-Event Continuing Calibration Verifications (CCVs)

Date 9-6-18
Time 0700
YSI ID SND09
Initials ST

This is a:
- [x] Daily Check
- [ ] End-of-Event Check

	Standard	Reading	Acceptance Range	Pass / Fail ?
pH 1	7.00 @ 24.8 °C	6.99	±0.2	Pass
pH 2 (optional)	@ °C		±0.2	
Sp Cond 1	7800	8168	±5%	Pass
Sp Cond 2 (optional)			±5%	
ORP	233.6 @ 23.6 °C	231.5	±10%	Pass

Dissolved Oxygen Calibration #1

Time of Day	0715	Temp, °C	22.31
Atmospheric Pressure	764.9	Pre-Cal DO%	\
DO Membrane Changed?	Yes	Pre-Cal DO mg/L	\
DO Charge *Range=25 to 75*	44	Post-Cal DO%	100.5
DO Gain *Range=0.7 to 1.5*	0.99	Post-Cal DO mg/L	8.73

Dissolved Oxygen Calibration #2

Time of Day		Temp, °C	
Atmospheric Pressure		Pre-Cal DO%	
DO Membrane Changed?		Pre-Cal DO mg/L	
DO Charge *Range=25 to 75*		Post-Cal DO%	
DO Gain *Range=0.7 to 1.5*		Post-Cal DO mg/L	

If you are only op-checking the DO, use the table below. Note that there are multiple columns to allow for multiple checks throughout the day. The water in Pinellas can foul DO membranes, requiring frequent sensor maintenance and recalibrations. Check the DO frequently to look for performance drift.

Dissolved Oxygen Op-Checks

Time of day						
Atmospheric Pressure						
Temperature, °C						
Known Saturation Value, mg/L *(From Table FS 2200-2 or FT 1500-1)*						
Saturation Value Reading, mg/L *(Acceptance Range is ± 0.3 mg/L of theoretical DO in H2O saturated air)*						
Pass / Fail?						

Turbidity 3-Point Check
Instrument: TRB05

Standard	Reading	Pass / Fail?
5.42	5.39	Pass
59.7	61.4	Pass
549	560	Pass

Turbidity Acceptance Ranges

0-10 ntu ±10%
10-40 ntu ±8%
41-100 ntu ±6.5%
>100 ntu ±5%

Temperature CCVs
(End of Event only)

Parameter	NIST Value	Reading	Acceptance Range	Pass / Fail ?
Temp low			±0.5°C from NIST	
Temp med				
Temp high				

For CCVs that fail, perform instrument maintenance as necessary and perform the calibration again.

PINELLAS Op-Check Worksheet

For Daily and End-of-Event Continuing Calibration Verifications (CCVs)

Date 9/7/18
Time 0700
YSI ID SND09
Initials GRB

This is a:
- [x] Daily Check
- [ ] End-of-Event Check

	Standard	Reading	Acceptance Range	Pass / Fail ?
pH 1	7.00 @ 27 °C	6.97	±0.2	P
pH 2 (optional)	@ °C		±0.2	
Sp Cond 1	7800	~~7743~~ 7910	±5%	P
Sp Cond 2 (optional)			±5%	
ORP	230 @ 27 °C	220	±10%	P

Dissolved Oxygen Calibration #1

Time of Day		Temp, °C	
Atmospheric Pressure		Pre-Cal DO%	
DO Membrane Changed?		Pre-Cal DO mg/L	
DO Charge *Range=25 to 75*		Post-Cal DO%	
DO Gain *Range=0.7 to 1.5*		Post-Cal DO mg/L	

Dissolved Oxygen Calibration #2

Time of Day		Temp, °C	
Atmospheric Pressure		Pre-Cal DO%	
DO Membrane Changed?		Pre-Cal DO mg/L	
DO Charge *Range=25 to 75*		Post-Cal DO%	
DO Gain *Range=0.7 to 1.5*		Post-Cal DO mg/L	

If you are only op-checking the DO, use the table below. Note that there are multiple columns to allow for multiple checks throughout the day. The water in Pinellas can foul DO membranes, requiring frequent sensor maintenance and recalibrations. Check the DO frequently to look for performance drift.

Dissolved Oxygen Op-Checks

Time of day	0700	1800				
Atmospheric Pressure	763.7	762.8				
Temperature, °C	26.04	27.66				
Known Saturation Value, mg/L *(From Table FS 2200-2 or FT 1500-1)*	8.12	7.88				
Saturation Value Reading, mg/L *(Acceptance Range is ± 0.3 mg/L of theoretical DO in H2O saturated air)*	8.19	7.75				
Pass / Fail?	P	Pass				

Turbidity 3-Point Check

Instrument: TRB05

Standard	Reading	Pass / Fail?
5.42	5.89	P
59.7	60.3	P
549	551	P

Turbidity Acceptance Ranges
0-10 ntu ±10%
10-40 ntu ±8%
41-100 ntu ±6.5%
>100 ntu ±5%

Temperature CCVs (End of Event only)

Parameter	NIST Value	Reading	Acceptance Range	Pass / Fail ?
Temp low			±0.5°C from NIST	
Temp med				
Temp high				

For CCVs that fail, perform instrument maintenance as necessary and perform the calibration again.

DO only

PINELLAS YSI Calibration Worksheet

Date 9/7/18
Time 1450
YSI ID SND09
Calibrated by BAER

Specific Conductance Calibration

Standard used (µmhos/cm or µS/cm)	
Pre-cal Reading (mS/cm)	
Cond Cell Constant *Range = 4.5 to 5.5*	

pH Calibration (Calibrate with the pH 7 buffer first)

Buffer pH	Temp (°C)	mV	Range (mV)	Pre-cal reading	Calibration value	Span	Range (mV)
4		A=	+127 to +227			A-B=	165-180
7		B=	-50 to +50			B-C=	165-180
10		C=	-227 to -127				

ORP Calibration

Temperature, °C	
Calibration value	
Pre-cal reading	
ORP Offset *Range = -100 to +100*	

Dissolved Oxygen Calibration

Time of Day	1450	Temp, °C	33.69
Atmospheric Pressure	762	Pre-Cal DO%	108.0
DO Membrane Changed?	N	Pre-Cal DO mg/L	7.48
DO Charge *Range=25 to 75*	52	Post-Cal DO%	100.2
DO Gain *Range=0.7 to 1.5*	0.95	Post-Cal DO mg/L	7.07

Temperature Check

NIST Temp, °C	
YSI Temp, °C *Range = ±0.5°C*	
NIST ID #	
NIST Cal Date	
NIST Cal Due Date	

	Manufacturer	Lot Number	Exp Date
pH 4 buffer			
pH 7 buffer			
pH 10 buffer			
Sp Cond 100			
Sp Cond 1,000			
Sp Cond 10,000			
Zobell Soln	Date Hydrated:		

ICVs (Initial Calibration Verifications)

Parameter	Known Value	Reading	Acceptance Range	Pass / Fail ?
pH			±0.2 units	
Sp Cond ~100			±5%	
Sp Cond ~10,000			±5%	
Temp low			±0.5°C from NIST	
Temp med				
Temp high				
D. O.	7.04	7.00	±0.3mg/L	P. @34.1
ORP			±10%	

For ICVs, calibration constants, or spans that fail, perform instrument maintenance as necessary and perform the calibration again.

PINELLAS Op-Check Worksheet

For Daily and End-of-Event Continuing Calibration Verifications (CCVs)

Date 9/8/18
Time 0700
YSI ID SND09
Initials GB

This is a:
- [x] Daily Check
- [ ] End-of-Event Check

	Standard	Reading	Acceptance Range	Pass / Fail ?
pH 1	7 @ °C	6.96	±0.2	P
pH 2 (optional)	@ °C		±0.2	
Sp Cond 1	7800	7780	±5%	P
Sp Cond 2 (optional)			±5%	
ORP	227 @ 28 °C	214	±10%	P

Dissolved Oxygen Calibration #1

Time of Day		Temp, °C	
Atmospheric Pressure		Pre-Cal DO%	
DO Membrane Changed?		Pre-Cal DO mg/L	
DO Charge *Range=25 to 75*		Post-Cal DO%	
DO Gain *Range=0.7 to 1.5*		Post-Cal DO mg/L	

Dissolved Oxygen Calibration #2

Time of Day		Temp, °C	
Atmospheric Pressure		Pre-Cal DO%	
DO Membrane Changed?		Pre-Cal DO mg/L	
DO Charge *Range=25 to 75*		Post-Cal DO%	
DO Gain *Range=0.7 to 1.5*		Post-Cal DO mg/L	

If you are only op-checking the DO, use the table below. Note that there are multiple columns to allow for multiple checks throughout the day. The water in Pinellas can foul DO membranes, requiring frequent sensor maintenance and recalibrations. Check the DO frequently to look for performance drift.

Dissolved Oxygen Op-Checks

Time of day	0700	1255				
Atmospheric Pressure	761.8	764				
Temperature, °C	26.26	33.81				
Known Saturation Value, mg/L *(From Table FS 2200-2 or FT 1500-1)*	8.07	7.08				
Saturation Value Reading, mg/L *(Acceptance Range is ± 0.3 mg/L of theoretical DO in H2O saturated air)*	8.07	7.14				
Pass / Fail?	P	P				

Turbidity 3-Point Check

Instrument: TR805

Standard	Reading	Pass / Fail?
5.42	5.79	P
59.7	61.9	P
549	551	P

Turbidity Acceptance Ranges

0-10 ntu ±10%
10-40 ntu ±8%
41-100 ntu ±6.5%
>100 ntu ±5%

Temperature CCVs
(End of Event only)

Parameter	NIST Value	Reading	Acceptance Range	Pass / Fail ?
Temp low			±0.5°C from NIST	
Temp med				
Temp high				

For CCVs that fail, perform instrument maintenance as necessary and perform the calibration again.

PINELLAS Op-Check Worksheet

For Daily and End-of-Event Continuing Calibration Verifications (CCVs)

Date 9/12/18
Time 0900
YSI ID SN909
Initials JG

This is a:
☐ Daily Check
☑ End-of-Event Check

	Standard	Reading	Acceptance Range	Pass / Fail ?
pH 1	7 @ 29.0 °C	7.00	±0.2	pass
pH 2 (optional)	@ °C		±0.2	
Sp Cond 1	7800	7659	±5%	pass
Sp Cond 2 (optional)			±5%	
ORP	225.8 @ 29.1 °C	205.9	±10%	pass

Dissolved Oxygen Calibration #1

Time of Day		Temp, °C	
Atmospheric Pressure		Pre-Cal DO%	
DO Membrane Changed?		Pre-Cal DO mg/L	
DO Charge *Range=25 to 75*		Post-Cal DO%	
DO Gain *Range=0.7 to 1.5*		Post-Cal DO mg/L	

Dissolved Oxygen Calibration #2

Time of Day		Temp, °C	
Atmospheric Pressure		Pre-Cal DO%	
DO Membrane Changed?		Pre-Cal DO mg/L	
DO Charge *Range=25 to 75*		Post-Cal DO%	
DO Gain *Range=0.7 to 1.5*		Post-Cal DO mg/L	

If you are only op-checking the DO, use the table below. Note that there are multiple columns to allow for multiple checks throughout the day. The water in Pinellas can foul DO membranes, requiring frequent sensor maintenance and recalibrations. Check the DO frequently to look for performance drift.

Dissolved Oxygen Op-Checks

Time of day	1255 on 9/8		End of Day/Event			
Atmospheric Pressure	764					
Temperature, °C	33.87					
Known Saturation Value, mg/L *(From Table FS 2200-2 or FT 1500-1)*	7.08					
Saturation Value Reading, mg/L *(Acceptance Range is ± 0.3 mg/L of theoretical DO in H2O saturated air)*	7.14					
Pass / Fail?	pass					

Turbidity 3-Point Check

Instrument:

Standard	Reading	Pass / Fail?

Turbidity Acceptance Ranges
0-10 ntu ±10%
10-40 ntu ±8%
41-100 ntu ±6.5%
>100 ntu ±5%

Temperature CCVs
(End of Event only)

Parameter	NIST Value	Reading	Acceptance Range	Pass / Fail ?
Temp low	12.9	12.52	±0.5°C from NIST	pass
Temp med	27.1	21.76		pass
Temp high	29.5	29.20		pass

For CCVs that fail, perform instrument maintenance as necessary and perform the calibration again.