

# TECHNICAL MEMORANDUM

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**To:** Nevada Environmental Response Trust

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**Cc:** Nevada Division of Environmental Protection  
United States Environmental Protection Agency

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**From:** Dan Pastor and Dana Grady

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**Date:** May 9, 2019

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**Subject:** Seep Well Field Area Bioremediation Treatability Study Quarterly Progress Report

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At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum which summarizes Tetra Tech's progress from January through March 2019 toward successfully implementing the Seep Well Field (SWF) Area Bioremediation Treatability Study.

## Task Progress Update: January – March 2019

### Task M11 – Seep Well Field Area Bioremediation Treatability Study (SWFTS)

- Task Leader – Dana Grady/Dan Pastor
- Current Status
  - *Treatability/Pilot Study Modification No. 6 – Seep Well Field Area Bioremediation Treatability Study (Mod 6)* was submitted to the Nevada Division of Environmental Protection (NDEP) on December 11, 2018 to recommend continuation of the study to evaluate long-term injection frequencies and injection well maintenance requirements. This modification was approved by NDEP on December 14, 2018. Performance of this scope remains ongoing. As part of this modification, progress reports are now submitted on a quarterly basis. Therefore, this is the first quarterly progress report submitted as part of Mod 6.
  - The first groundwater sampling under Mod 6 was performed in December 2018/January 2019. Results of this groundwater sampling event (approximately six months following the third injection event) are summarized below. For reference, the attached Figure 1 provides a map of the injection and monitoring well locations and includes the baseline groundwater potentiometric surface. Well construction details and a summary of the groundwater analytical results for perchlorate, chlorate, nitrate, total organic carbon (TOC), and dissolved oxygen through January 2019 are provided in Tables 1 and 2, respectively.
    - Effectiveness monitoring results continue to indicate that perchlorate concentrations remain at levels significantly below their respective baseline concentrations in groundwater samples collected from the monitoring wells between and downgradient of the injection well transects (with baseline concentrations ranging from 2,400 to 23,000 micrograms per liter [ $\mu\text{g/L}$ ] and December 2018/January 2019 concentrations ranging

from less than 15 µg/L to 6,300 µg/L). Specifically, 18 of the monitoring wells located in between or downgradient of the injection well transects continued to observe a greater than 50% reduction in groundwater perchlorate concentrations. Of these 18 monitoring wells, groundwater samples from eight wells observed a greater than 75% reduction in perchlorate concentrations when compared to baseline concentrations. Certain downgradient wells, such as SWFTS-MW9B and PC-94, had relatively stable concentrations compared to the previous sampling events following the third injection event. Perchlorate in groundwater samples collected from SWFTS-MW10A appeared to increase slightly as did perchlorate in groundwater samples from SWFTS-MW05B. Therefore, it appeared that a follow up injection event would be needed to optimize and maximize perchlorate degradation in groundwater in downgradient areas.

- Groundwater samples collected from monitoring wells between the injection well transects continue to indicate perchlorate concentration decreases, including concentrations in groundwater samples from monitoring wells SWFTS-MW14 and SWFTS-MW16 at less than 0.95 µg/L and 270 µg/L, respectively. Groundwater samples from SWFTS-MW02 and SWFTS-MW15 also continued to show decreases in perchlorate concentrations when compared to baseline, including the lowest concentrations to date at both wells during the December 2018/January 2019 event (620 and 5,300 µg/L, respectively). Perchlorate concentrations in groundwater samples collected from monitoring well SWFTS-MW16 remain significantly lower (greater than 97 percent lower) compared to baseline, although perchlorate concentrations during the September, October, and December sampling events were slightly higher than immediately after the third injection event.
- Groundwater samples collected from monitoring wells downgradient of the injection well transects also continue to indicate perchlorate concentration decreases similar to those observed following the first injection event, with nearly all downgradient monitoring wells showing at least a 50% reduction and five monitoring wells showing greater than 75% reduction.
- Chlorate concentrations in groundwater follow decreasing trends similar to perchlorate, with 12 downgradient monitoring wells exhibiting greater than 80% reduction in chlorate concentrations in groundwater when compared to baseline. This includes five locations (PC-91, SWFTS-MW03, SWFTS-MW10A, SWFTS-MW14, and SWFTS-MW16) where chlorate concentrations in groundwater were less than 100 µg/L following the third injection event.
- Nitrate concentrations in groundwater were also evaluated since it is the most likely competing electron acceptor and carbon substrate consumer. Nitrate concentrations in groundwater were generally greater than 10 milligrams per liter (mg/L) during the baseline sampling event. Groundwater from several downgradient monitoring wells continued to have low nitrate concentrations, with samples from 5 monitoring wells having nitrate concentrations less than 1 mg/L. However, the average nitrate concentration in groundwater from downgradient monitoring wells during the December 2018/January 2019 sampling event was 7 mg/L, which is slightly higher than the average concentrations observed during previous events. This may signal the gradual depletion of carbon substrate in the groundwater and the need for an additional injection event because nitrate is the favored electron acceptor for microbial respiration. Increasing nitrate concentrations is often an indication that carbon substrate is beginning to be a limiting factor for perchlorate biodegradation.

- The fourth injection event began on January 21, 2019 and was completed on February 10, 2019. The carbon substrate quantities that were injected were similar to quantities during the first and third injection events. A total of 83,760 gallons of carbon substrate injectate solution was added during the fourth injection event. Following the injections of the carbon substrate solution, a total of 314,865 gallons of chase water was injected into the aquifer to enhance carbon substrate distribution. Summary tables of injection well construction details and injection quantities and rates during the fourth injection event are provided in Tables 3 and 4, respectively.
- Of the 25 injection wells used for the four injection events, only two wells (SWFTS-IW13B and SWFTS-IW19) did not accept injectate additions at the maximum allowable pressure of 35 pounds per square inch (psi) during the fourth injection event. Injection pressures in injection well SWFTS-IW13B showed a gradual upward trend over the first three injection events, and based on this trend, it was expected that this well could require rehabilitation at some point. However, increasing injection pressures were not previously observed for injection well SWFTS-IW19, with injection rates in the third injection event observed at consistent flows that exceeded 6 gallons per minute at approximately 10 psi. Therefore, the injection pressures observed at this injection well appear to be an anomaly that will be further evaluated. Based on the observations during the fourth injection event, these two injection wells will likely be rehabilitated in the near future. Implementing and evaluating injection rehabilitation is an objective of the extended SWF treatability study operations.
- Prior to the next injection event, groundwater samples from injection wells SWFTS-IW13B and SWFTS-IW19 will be collected and analyzed for inorganic and organic composition. Analyses will quantify the solids content and percentage of organic material, which could include biomass and breakdown organic compounds from the emulsified vegetable oil (EVO) addition, as well as the content and types of inorganic cations. Understanding the biomass and EVO breakdown components in the water samples is key to determine if and when rehabilitation methods are required. Biomass has a dual value in being essential to degrade perchlorate while at the same time can serve as a source of organic carbon and biodegrade itself over time. Additionally, because the EVO that is injected moves radially around the injection well, some of the solids could include breakdown products that linger in the immediate vicinity of the formation but also get consumed over time. Therefore, an understanding of the composition of the groundwater samples collected from these injection wells is important to evaluate these possibilities of natural breakdown and flushing. In addition, a downhole video survey will be completed at each well to document the condition of the injection well screen.
- A decision to rehabilitate the two injection wells, SWFTS-IW13B and SWFTS-IW19, and the method of rehabilitation will be made once the groundwater samples collected from these injection wells and the video logs are analyzed and evaluated by Tetra Tech and the Trust. As described in the Treatability/Pilot Study Modification No. 6 – Seep Well Field Area Bioremediation Treatability Study, if rehabilitation is required, conventional well redevelopment (swabbing/scrubbing/surging or jetting with water), shock chlorination via the application of chlorine dioxide or other chemicals, and/or the addition of acidic agents may be evaluated to determine the most appropriate rehabilitation technique. This is an important maintenance component for ISB operations that could apply to future studies and long-term implementation.
- Groundwater sampling was performed approximately two weeks following completion of the fourth injection event, during the week of February 25, 2019. Results from this sampling event will be summarized in the next quarterly progress report after the data have been reviewed and validated.
- Schedule and Progress Updates
  - This task remains on schedule. The next groundwater sampling event is planned for April 2019.

- The SWF Area Bioremediation Treatability Study Results Report was submitted on May 6, 2019. This report includes a summary of activities and results for all work completed as part of the original study. A summary of activities and results of the work associated with Mod 6 will be presented in quarterly progress reports and an annual performance report.
- Health and Safety
  - There were no safety incidents related to Task M11 during the reporting period from January through March 2019.

## CERTIFICATION

### Seep Well Field Area Bioremediation Treatability Study Quarterly Progress Report

**Nevada Environmental Response Trust Site  
(Former Tronox LLC Site)  
Henderson, Nevada**

#### **Nevada Environmental Response Trust (NERT) Representative Certification**

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Signature:** Jay A. Steinberg Not Individually, but Solely as President of the Trustee, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Name:** Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Title:** Solely as President and not individually

**Company:** Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Date:** 5/9/19

## CERTIFICATION

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I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

**Description of Services Provided:** Prepared Seep Well Field Area Bioremediation Treatability Study Quarterly Progress Report.



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**Kyle Hansen, CEM**  
Field Operations Manager/Geologist  
Tetra Tech, Inc.

May 9, 2019

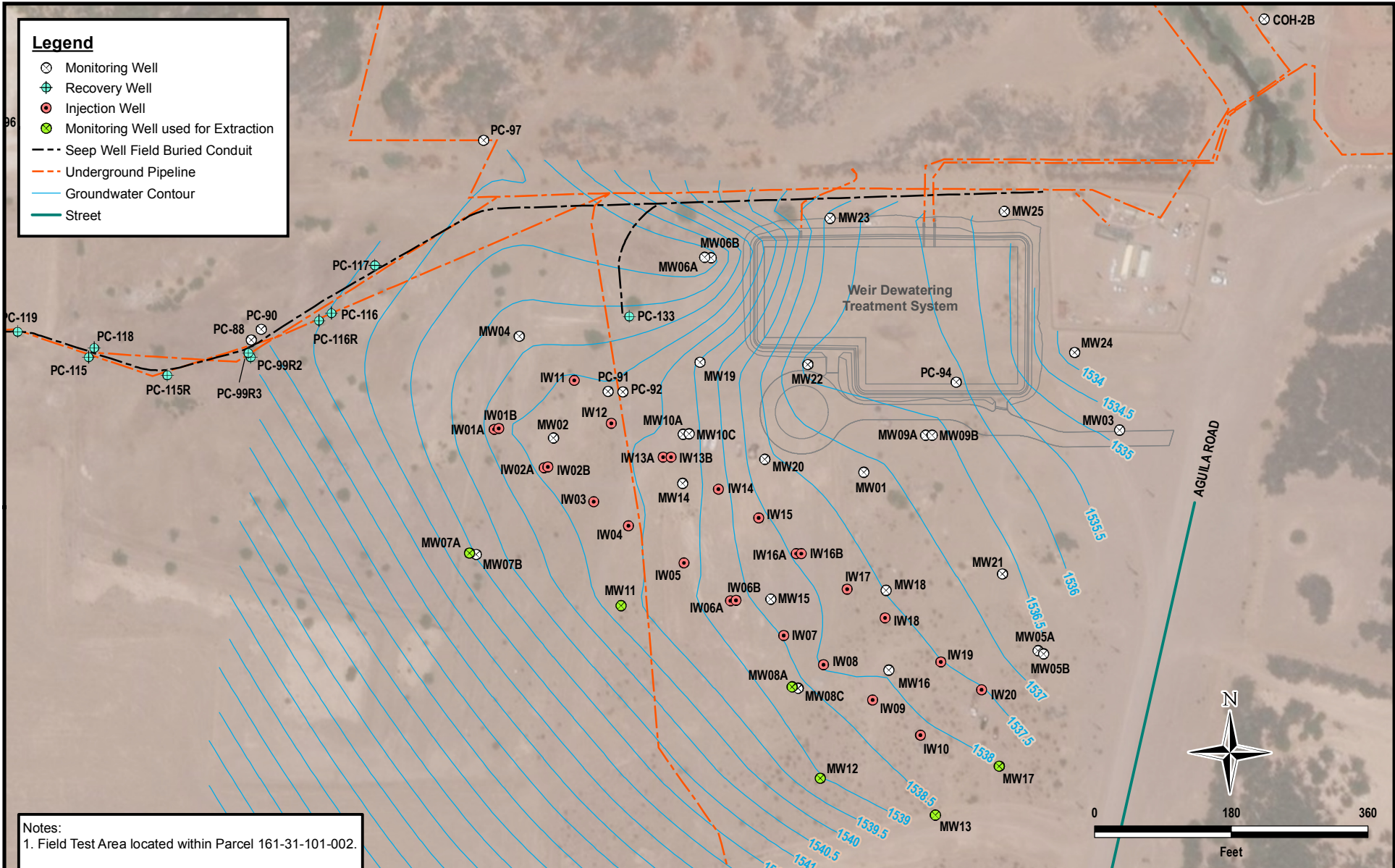
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Date

Nevada CEM Certificate Number: 2167  
Nevada CEM Expiration Date: September 18, 2020

# Figures

\\TTS100FS1\PROJECTS\INERT\GIS FIGURE DATABASE\MXD\MP\FIGURE 1\_2.MXD



**Legend**

- ⊗ Monitoring Well
- ⊕ Recovery Well
- ⊙ Injection Well
- ⊗ Monitoring Well used for Extraction
- - - Seep Well Field Buried Conduit
- - - Underground Pipeline
- Groundwater Contour
- Street

**Notes:**

1. Field Test Area located within Parcel 161-31-101-002.
2. The prefix 'SWTFS-' not shown for wells labeled as MW or IW. (MW03 = SWTFS-MW03)
3. Groundwater potentiometric contours presented are based on water levels collected during the baseline groundwater sampling event in July 2017.
4. Imagery Source: Esri World Map, June 2015

**TETRA TECH**

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**NEVADA ENVIRONMENTAL RESPONSE TRUST**

MONTHLY PROGRESS UPDATE

**MONITORING AND INJECTION WELL LAYOUT**

Project No.:	117-7502018
Date:	MAY 31, 2018
Designed By:	SRA
Figure No.	<b>1</b>



## Tables

**Table 1**  
**Monitoring Wells**  
 Seep Well Field Bioremediation Treatability Study

Monitoring Well/Borehole ID	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water <sup>1</sup>	Well Diameter	Borehole Diameter	Borehole Total Depth	Well Total Depth	Bottom of Screen	Top of Screen	Screen Length	Slot Size
			feet amsl	feet amsl	feet bTOC	inches	inches	feet bgs	feet bgs	feet bgs	feet bgs	feet	inches
<b>Newly Installed Monitoring Wells (February-June 2017)</b>													
SWFTS-MW01	26733003.73	832067.12	1552.68	1552.39	15.25	2	6	43	39.4	38.9	24.2	15	0.020
SWFTS-MW02	26733048.86	831657.82	1553.90	1553.63	13.80	2	6	41	33.5	33.1	18.4	15	0.020
SWFTS-MW03	26733059.49	832404.39	1549.26	1549.02	14.15	2	6	60	42.2	42.1	27.2	15	0.020
SWFTS-MW04	26733183.35	831612.29	1552.16	1551.82	11.15	2	6	45	40.9	40.4	25.8	15	0.020
SWFTS-MW05A	26732768.53	832296.89	1555.41	1554.91	18.35	2	6	30	29.4	29.3	19.3	10	0.020
SWFTS-MW05B	26732764.09	832304.67	1555.41	1554.86	18.28	2	6	44	42.5	42.0	32.3	10	0.020
SWFTS-MW06A	26733287.15	831857.05	1549.03	1548.41	6.43	2	6	23	21.9	21.4	11.8	10	0.020
SWFTS-MW06B	26733286.65	831865.75	1548.86	1548.59	6.70	2	6	40	36.0	35.5	25.9	10	0.020
SWFTS-MW07A	26733052.94	832148.65	1555.90	1555.64	14.25	4	8	31	30.1	29.5	15	15	0.020
SWFTS-MW07B	26732895.65	831555.99	1555.90	1555.53	13.95	2	6	55	38.9	38.3	33.8	5	0.020
SWFTS-MW08A	26733052.55	832157.19	1556.50	1556.03	17.26	4	8	36	35.3	34.8	20.2	15	0.020
SWFTS-MW08C	26732897.49	831547.35	1556.56	1556.18	18.34	2	6	70	70.0	69.5	49.9	20	0.020
SWFTS-MW09A	26733054.00	831828.76	1551.61	1551.16	14.50	4	8	30	29.4	28.9	19.3	10	0.020
SWFTS-MW09B	26732720.57	831972.55	1551.74	1551.27	14.60	2	6	56	39.5	39.0	34.4	5	0.020
SWFTS-MW10A	26733054.15	831836.75	1551.92	1551.61	12.23	4	8	36	35.5	35.0	20.4	15	0.020
SWFTS-MW10C	26732718.60	831980.38	1551.85	1551.61	9.99	2	6	64	63.6	63.1	43.5	20	0.020
SWFTS-MW11	26732827.46	831747.30	1558.68	1558.10	18.44	4	10	43	40.0	39.6	14.8	25	0.020
SWFTS-MW12	26732600.73	832009.72	1559.00	1558.66	19.65	4	10	45	41.0	40.6	15.8	25	0.020
SWFTS-MW13	26732551.81	832161.20	1563.57	1563.20	24.65	4	10	51	48.0	47.6	17.8	30	0.020
SWFTS-MW14	26732989.39	831828.48	1552.20	1551.89	12.52	2	8	39	37.0	36.6	16.8	20	0.020
SWFTS-MW15	26732836.67	831944.36	1553.64	1553.34	15.00	2	8	37	35.0	34.6	14.8	20	0.020
SWFTS-MW16	26732742.78	832100.29	1561.83	1561.45	23.50	2	8	45	42.0	41.6	21.8	20	0.020
SWFTS-MW17	26732616.54	832245.85	1565.87	1565.56	27.53	4	10	55	53.0	52.6	22.8	30	0.020
SWFTS-MW18	26732847.58	832096.15	1554.59	1554.03	16.55	2	8	39.3	37.0	36.6	16.8	20	0.020
SWFTS-MW19	26733148.9	831850.68	1550.57	1550.37	11.48	2	8	35	31.5	31.1	11.3	20	0.020
SWFTS-MW20	26733020.92	831936.43	1551.63	1551.22	13.62	2	8	39	38.0	37.6	12.8	25	0.020
SWFTS-MW21	26732869.95	832249.88	1553.56	1553.30	16.60	2	8	41.3	40.0	39.6	14.8	25	0.020
SWFTS-MW22	26733146.27	831993.33	1549.55	1549.15	12.82	2	8	35	32.0	31.6	11.8	20	0.020
SWFTS-MW23	26733338.19	832022.56	1547.58	1550.16	13.38	2	8	38	34.0	33.6	13.8	20	0.020
SWFTS-MW24	26733161.74	832345.44	1547.78	1547.49	13.86	2	8	41	38.0	37.6	12.8	25	0.020
SWFTS-MW25	26733347.67	832252.13	1546.73	1546.37	11.20	2	8	44	43.0	42.6	12.8	30	0.020

**Table 1**  
**Monitoring Wells**  
 Seep Well Field Bioremediation Treatability Study

Monitoring Well/Borehole ID	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water <sup>1</sup>	Well Diameter	Borehole Diameter	Borehole Total Depth	Well Total Depth	Bottom of Screen	Top of Screen	Screen Length	Slot Size
			feet amsl	feet amsl	feet bTOC	inches	inches	feet bgs	feet bgs	feet bgs	feet bgs	feet	inches
<b>Existing Monitoring Wells within Treatability Study Area</b>													
<b>COH-2B</b>	26733593.69	832598.59	1544.42	1547.08	16.49	2	-	-	67	-	-	-	-
<b>PC-58</b>	26732118.20	831123.78	1574.21	1576.54	22.70	2	8	36	33	32.8	7.8	25	0.020
<b>PC-91</b>	26733111.11	831729.78	1552.63	1552.17	12.40	2	8	30	22	21.5	11.5	10	0.020
<b>PC-92</b>	26733110.00	831748.84	1552.14	1551.83	12.05	2	8	65	37	36.5	26.5	10	0.020
<b>PC-94</b>	26733122.77	832188.74	1548.05	1549.89	12.79	2	8	25	19.5	19.5	9.5	10	0.020
<b>PC-97</b>	26733441.54	831565.69	1548.88	1548.42	6.27	2	8	45	33.5	33	23	10	0.020
<b>PC-88</b>	26733178.42	831259.41	1550.90	1550.83	7.13	2	8	62	50.5	50	40	10	0.020

Notes:

- amsl - above mean sea level
- bTOC - below top of casing
- bgs - below ground surface
- Not Available

1. Depth to water measurements collected during baseline groundwater sampling event on July 10, 2017. Water levels from COH-2B and PC-88 are from the first event following injections (September 19, 2017).

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
COH-2B	8/9/2017	COH-2B1-BL02	N	BL02	1,700	1,800	0.71	2.3	1.14
COH-2B	9/22/2017	SWFTS-COH-2B1-EM01	N	EM01	1,700	1,600	0.53 J	2.7	1.19
COH-2B	10/5/2017	SWFTS-COH-2B1-EM03	N	EM03	1,800	1,400	0.60	2.6	0.14
COH-2B	10/12/2017	SWFTS-COH-2B1-EM04	N	EM04	1,800	1,600	0.58	2.3	7.92
COH-2B	10/26/2017	SWFTS-COH-2B1-EM05	N	EM05	1,900	1,400	0.42 J	2.6	0.40
COH-2B	12/14/2017	COH-2B1-EM07	N	EM07	1,700	5,000	0.40	2.6	-0.06 E
COH-2B	2/22/2018	COH-2B1-EM08	N	EM08	1,500	1,400	0.57 J	2.9	0.34
COH-2B	3/29/2018	COH-2B1-EM09	N	EM09	1,800	1,200	<0.55	2.3	0.41
COH-2B	5/2/2018	COH-2B1-EM10	N	EM10	1,700	1,200	0.45	11	0.00
COH-2B	7/10/2018	COH-2B1-EM11	N	EM11	3,000	2,400	1.4	1.9	0.47
COH-2B	8/16/2018	COH-2B1-EM13	N	EM13	1,500	980	0.53 J	2.6	0.50
COH-2B	9/11/2018	COH-2B1-EM14	N	EM14	2,800	3,800	1.5	1.9	2.18
COH-2B	10/11/2018	COH-2B1-EM15	N	EM15	1,700	1,000	0.54 J	2.7	2.79
COH-2B	1/3/2019	COH-2B1-EM16	N	EM16	3,200	3,800	2.5	2.0	0.97
PC-58	3/28/2017	PC-58-BL01	N	BL01	2,600	19,000	9.9	3.4	0.15
PC-58	7/13/2017	PC-58-BL02	N	BL02	2,600	17,000	9.5	2.8	0.00
PC-58	10/11/2017	SWFTS-PC-58-EM04	N	EM04	1,800	11,000	9.0	3.2	3.40
PC-58	11/16/2017	SWFTS-PC-58-EM06	N	EM06	2,100	16,000	10	2.9	0.65
PC-58	12/14/2017	PC-58-EM07	N	EM07	3,100	24,000	12	2.9	0.29
PC-58	2/21/2018	PC-58-EM08	N	EM08	3,700	35,000	12	5.4	2.49
PC-58	3/28/2018	PC-58-EM09-EM09	N	EM09	1,400	12,000	9.8	2.7	4.31
PC-58	5/2/2018	PC58-EM10	N	EM10	1,200	10,000	9.9	2.7	0.71
PC-58	7/11/2018	PC-58-EM11	N	EM11	1,100	9,800	10	2.6	1.17
PC-58	8/15/2018	PC-58-EM13	N	EM13	1,300	13,000	10	3.1	0.38
PC-58	9/13/2018	PC-58-EM14	N	EM14	1,500	22,000	14	2.5	2.74
PC-58	10/11/2018	PC-58-EM15	N	EM15	1,300	13,000	12	3.5	0
PC-58	1/3/2019	PC-58-EM16	N	EM16	980	8,000	10	3.5	0.83
PC-88	9/22/2017	SWFTS-PC-88-EM01	N	EM01	15,000	6,900	4.8	2.7	4.15
PC-88	9/28/2017	SWFTS-PC-88-EM02	N	EM02	14,000 J+	6,300	5.8	2.8	1.13
PC-88	10/4/2017	SWFTS-PC-88-EM03	N	EM03	15,000	6,100	5.1	2.6	0.21
PC-88	10/11/2017	SWFTS-PC-88-EM04	N	EM04	15,000	6,200	4.6	2.5	0.37
PC-88	10/11/2017	SWFTS-PC-88-EM04-FD	FD	EM04	15,000	6,000	4.6	2.6	---
PC-88	10/25/2017	SWFTS-PC-88-EM05	N	EM05	15,000	5,400	5.0	2.8	0.37
PC-88	11/15/2017	PC-88-EM06	N	EM06	15,000	5,700	4.5	2.8	0.46
PC-88	11/15/2017	PC-88-EM06-FD	FD	EM06	16,000	5,700	4.6	2.9	---
PC-88	12/14/2017	PC-88-EM07	N	EM07	19,000	20,000	9.9	2.7	0.68
PC-88	2/22/2018	PC-88-EM08	N	EM08	6,700	14,000	12	3.0	0.29
PC-88	3/29/2018	PC-88-EM09	N	EM09	9,100	20,000	13	2.2	0.45
PC-88	5/2/2018	PC88-EM10	N	EM10	7,100	11,000	11	2.3	0.50
PC-88	5/2/2018	PC88-EM10-FD	FD	EM10	6,600	11,000	12	2.5	---
PC-88	7/12/2018	PC-88-EM11	N	EM11	16,000	12,000	7.8	2.4	0.89
PC-88	7/12/2018	PC-88-EM11-FD	FD	EM11	16,000	12,000	7.6	2.3	---
PC-88	8/16/2018	PC-88-EM13	N	EM13	10,000	6,700	6.0	2.9	3.31
PC-88	8/16/2018	PC-88-EM13-FD	FD	EM13	11,000	6,800	6.0	2.9	---
PC-88	9/12/2018	PC-88-EM14	N	EM14	19,000	13,000	6.7	2.6	2.28
PC-88	9/12/2018	PC-88-EM14-FD	FD	EM14	19,000	13,000	6.7	2.4	---
PC-88	10/11/2018	PC-88-EM15	N	EM15	15,000	15,000	6.3 J-	2.7	0

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
PC-88	10/11/2018	PC-88-EM15-FD	FD	EM15	15,000	15,000	7.5	2.7	---
PC-88	1/3/2019	PC-88-EM16	N	EM16	12,000	9,900	7.5	2.7	0.93
PC-88	1/3/2019	PC-88-EM16-FD	FD	EM16	12,000	9,900	7.5	2.8	---
PC-91	3/29/2017	PC-91-BL01	N	BL01	2,400	1,700	1.4	2.7	0.25
PC-91	7/12/2017	PC-91-BL02	N	BL02	2,500	1,600	1.2	2.4	0.31
PC-91	7/12/2017	PC-91-BL02-FD	FD	BL02	2,400	1,500	1.1	2.3	---
PC-91	9/21/2017	SWFTS-PC-91-EM01	N	EM01	1,600	820	0.50 J	2.3	0.47
PC-91	9/27/2017	SWFTS-PC-91-EM02	N	EM02	1,700	810	0.57	2.8	0.72
PC-91	10/4/2017	SWFTS-PC-91-EM03	N	EM03	1,300	590	0.58	2.9	0.19
PC-91	10/12/2017	SWFTS-PC-91-EM04	N	EM04	960	440	0.35	2.5	0.38 E
PC-91	10/25/2017	SWFTS-PC-91-EM05	N	EM05	750	370	0.62	2.7	0.55
PC-91	11/16/2017	SWFTS-PC-91-EM06	N	EM06	700	610	0.65 J-	2.8	0.82
PC-91	12/13/2017	PC-91-EM07	N	EM07	770	520	0.38	2.5	0.37
PC-91	2/20/2018	PC-91-EM08	N	EM08	900	1,100	0.88 J	2.8	0.82
PC-91	3/26/2018	PC-91-EM09	N	EM09	930	1,200	0.78	2.5	1.02
PC-91	5/1/2018	PC-91-EM10	N	EM10	860	260	0.56	2.4	0.64
PC-91	7/11/2018	PC-91-EM11	N	EM11	190	<5.0	<0.28	2.7	3.08
PC-91	7/27/2018	SWFTS-PC-91-EM12	N	EM12	160	<2.0	---	---	0.77
PC-91	8/14/2018	PC-91-EM-13	N	EM13	310	12 J	<0.28	3.0	1.08
PC-91	9/12/2018	PC-91-EM14	N	EM14	440	21	<0.28	2.6	3.12
PC-91	10/10/2018	PC-91-EM15	N	EM15	460	80	<0.55	3.1	0
PC-91	12/20/2018	PC-91-EM16	N	EM16	220	47 J	<0.11	3.2	0.68
PC-92	3/29/2017	PC-92-BL01	N	BL01	9,600	17,000	4.2	2.8	0.35
PC-92	7/12/2017	PC-92-BL02	N	BL02	4,400	10,000	2.6	2.8	0.31
PC-92	9/21/2017	SWFTS-PC-92-EM01	N	EM01	3,100	7,700	1.7	2.6	0.41
PC-92	9/27/2017	SWFTS-PC-92-EM02	N	EM02	3,500	6,800	1.7	2.8	0.45
PC-92	10/4/2017	SWFTS-PC-92-EM03	N	EM03	3,700	7,100	2.6	2.8	0.12
PC-92	10/12/2017	SWFTS-PC-92-EM04	N	EM04	3,700	7,300	2.1	2.8	9.88 E
PC-92	10/12/2017	SWFTS-PC-92-EM04-FD	FD	EM04	3,700	6,700	2.0	2.6	---
PC-92	10/25/2017	SWFTS-PC-92-EM05	N	EM05	4,000	6,900	2.3	2.9	0.30
PC-92	11/16/2017	SWFTS-PC-92-EM06	N	EM06	2,100	1,300	1.6	3.2	0.42
PC-92	11/16/2017	SWFTS-PC-92-EM06-FD	FD	EM06	2,100	1,300	1.1	3.3	---
PC-92	12/14/2017	PC-92-EM07	N	EM07	3,300	4,600	2.1	3.0	3.78
PC-92	12/14/2017	PC-92-EM07-FD	FD	EM07	3,300	4,800	1.8	3.0	---
PC-92	2/20/2018	PC-92-EM08	N	EM08	4,900	7,700	2.7	3.2	4.60
PC-92	2/20/2018	PC-92-EM08-FD	FD	EM08	5,000	7,400	2.7	3.2	---
PC-92	3/26/2018	PC-92-EM09	N	EM09	7,900	19,000	4.5	2.5	0.51
PC-92	3/26/2018	PC-92-EM09-FD	FD	EM09	8,000	18,000	4.5	2.5	---
PC-92	5/1/2018	PC-92-EM10	N	EM10	9,200	22,000	5.6	2.4	0.70
PC-92	7/11/2018	PC-92-EM11	N	EM11	7,300	17,000	4.2	2.3	1.47
PC-92	7/27/2018	SWFTS-PC-92-EM12	N	EM12	5,200	15,000	---	---	0.28
PC-92	8/15/2018	PC-92-EM13	N	EM13	4,700	13,000	3.1	3.0	0.98
PC-92	9/12/2018	PC-92-EM14	N	EM14	4,100	12,000	2.6	2.6	2.95
PC-92	10/11/2018	PC-92-EM15	N	EM15	4,200	12,000	3.4	2.9	0
PC-92	12/20/2018	PC-92-EM16	N	EM16	3,500	13,000	2.6	3.1	0.72
PC-94	3/28/2017	PC-94-BL01	N	BL01	13,000	51,000	12	1.7	0.33
PC-94	7/13/2017	PC-94-BL02	N	BL02	14,000	47,000	12	1.3	0.41

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
PC-94	9/20/2017	SWFTS-PC-94-EM01	N	EM01	2,300	3,800	0.58 J	34	0.15
PC-94	9/26/2017	SWFTS-PC-94-EM02	N	EM02	2,000	3,700	<1.1	37	0.19
PC-94	10/5/2017	SWFTS-PC-94-EM03	N	EM03	1,700	3,600	1.3 J	5.2	0.13
PC-94	10/11/2017	SWFTS-PC-94-EM04	N	EM04	970	2,900	0.78 J	3.9	0.55
PC-94	10/26/2017	SWFTS-PC-94-EM05	N	EM05	540	1,300	1.4	3.1	3.80
PC-94	11/16/2017	PC-94-EM06	N	EM06	1,500	1,300	0.57 J	2.2	0.50
PC-94	12/12/2017	PC-94-EM07	N	EM07	4,300	9,300	0.68	2.1	0.19
PC-94	2/21/2018	PC-94-EM08	N	EM08	7,200	19,000	4.9	2.1	3.75
PC-94	3/27/2018	PC-94-EM09	N	EM09	6,400	16,000	4.8	1.9	2.07
PC-94	5/1/2018	PC-94-EM10	N	EM10	6,700	18,000	6.3	1.5	0.00
PC-94	7/10/2018	PC-94-EM11	N	EM11	4,200	7,200	5.6	2.0	0.10
PC-94	7/27/2018	SWFTS-PC-94-EM12	N	EM12	1,500	1,600	---	---	0.25
PC-94	8/15/2018	PC-94-EM13	N	EM13	2,600	1,800	3.2	2.2	1.53
PC-94	9/11/2018	PC-94-EM14	N	EM14	3,500	6,200	5.2	1.7	1.67
PC-94	10/11/2018	PC-94-EM15	N	EM15	3,900	10,000	8.2	1.9	0
PC-94	12/28/2018	PC-94-EM16	N	EM16	3,200	9,000	8.3	1.7	4.54
PC-97	7/13/2017	PC-97-BL02	N	BL02	1,900	180	0.84	3.0	0.27
PC-97	9/22/2017	SWFTS-PC-97-EM01	N	EM01	2,900	360	2.1	3.0	0.39
PC-97	9/22/2017	SWFTS-PC-97-EM01-FD	FD	EM01	2,900	340	2.2	3.0	---
PC-97	9/28/2017	SWFTS-PC-97-EM02	N	EM02	2,600	370	2.1	3.6	4.28
PC-97	9/28/2017	SWFTS-PC-97-EM02-FD	FD	EM02	2,700	380	2.0	3.6	---
PC-97	10/4/2017	SWFTS-PC-97-EM03	N	EM03	2,900	460	2.6	2.7	0.19
PC-97	10/4/2017	SWFTS-PC-97-EM03-FD	FD	EM03	2,900	410	2.3	2.8	---
PC-97	10/11/2017	SWFTS-PC-97-EM04	N	EM04	2,500	400	2.5	2.7	0.48
PC-97	10/11/2017	SWFTS-PC-97-EM04-FD	FD	EM04	2,700	390	2.3	2.8	---
PC-97	10/25/2017	SWFTS-PC-97-EM05	N	EM05	3,400	390	2.9	2.8	0.39
PC-97	10/25/2017	SWFTS-PC-97-EM05-FD	FD	EM05	3,300	410	2.9	2.9	---
PC-97	11/16/2017	SWFTS-PC-97-EM06	N	EM06	1,600	190	1.8	3.2	0.48
PC-97	12/13/2017	PC-97-EM07	N	EM07	2,600	320	1.6	3.0	0.79
PC-97	12/13/2017	PC-97-EM07-FD	FD	EM07	3,000	320	1.9	3.0	---
PC-97	2/21/2018	PC-97-EM08	N	EM08	1,500	77	0.56	3.3	2.47
PC-97	3/27/2018	PC-97-EM09	N	EM09	900	<10	0.19	3.3	1.68
PC-97	5/1/2018	PC-97-EM10	N	EM10	820	<5.0	0.088 J	3.2	2.10
PC-97	7/10/2018	PC-97-EM11	N	EM11	1,700	91	0.32	3.0	3.45
PC-97	8/16/2018	PC-97-EM13	N	EM13	1,100	85	0.38 J+	3.4	2.94
PC-97	9/12/2018	PC-97-EM14	N	EM14	2,400	210	0.82	3.0	1.74
PC-97	10/11/2018	PC-97-EM15	N	EM15	1,700	160	0.71	3.4	0.71
PC-97	1/3/2019	PC-97-EM16	N	EM16	1,500	64	0.33	3.2	1.07
SWFTS-IW01A	7/11/2017	SWFTS-IW01A-BL02	N	BL02	20,000	51,000	12	---	0.55
SWFTS-IW01A	11/14/2017	SWFTS-IW01A-EM06	N	EM06	42	---	<0.55	610 J-	0.09
SWFTS-IW01A	11/14/2017	SWFTS-IW01A-EM06B	N	EM06	---	---	---	610 J-	---
SWFTS-IW01B	7/11/2017	SWFTS-IW01B-BL02	N	BL02	20,000	48,000	11	---	0.61
SWFTS-IW01B	11/14/2017	SWFTS-IW01B-EM06B	N	EM06	---	---	---	160 J-	---
SWFTS-IW01B	11/15/2017	SWFTS-IW01B-EM06	N	EM06	170	---	<0.55	220	0.17
SWFTS-IW02A	7/11/2017	SWFTS-IW02A-BL02	N	BL02	22,000	52,000	12	2.0	0.57
SWFTS-IW02A	11/14/2017	SWFTS-IW02A-EM06B	N	EM06	---	---	---	3,900 J-	---
SWFTS-IW02B	7/11/2017	SWFTS-IW02B-BL02	N	BL02	22,000	55,000	12	2.8	0.46

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-IW02B	11/14/2017	SWFTS-IW02B-EM06B	N	EM06	---	---	---	3,100 J-	---
SWFTS-IW03	7/11/2017	SWFTS-IW03-BL02	N	BL02	21,000	58,000	13	---	0.48
SWFTS-IW03	7/11/2017	SWFTS-IW03-BL02-FD	FD	BL02	21,000	53,000	12	---	---
SWFTS-IW03	12/11/2017	SWFTS-IW03-EM07	N	EM07	---	---	---	340 J-	---
SWFTS-IW04	7/11/2017	SWFTS-IW04-BL02	N	BL02	17,000	42,000	11	---	0.42
SWFTS-IW04	7/11/2017	SWFTS-IW04-BL02-FD	FD	BL02	16,000	42,000	12	---	---
SWFTS-IW04	12/11/2017	SWFTS-IW04-EM07	N	EM07	---	---	---	4,600 J-	---
SWFTS-IW05	7/11/2017	SWFTS-IW05-BL02	N	BL02	15,000	45,000	12	1.7	0.53
SWFTS-IW05	12/11/2017	SWFTS-IW05-EM07	N	EM07	---	---	---	3,700 J-	---
SWFTS-IW06A	7/11/2017	SWFTS-IW06A-BL02	N	BL02	15,000	46,000	12	---	2.02
SWFTS-IW06A	11/14/2017	SWFTS-IW06A-EM06B	N	EM06	---	---	---	440 J-	---
SWFTS-IW06A	11/15/2017	SWFTS-IW06A-EM06	N	EM06	230	---	<0.55	630	0.16
SWFTS-IW06B	7/11/2017	SWFTS-IW06B-BL02	N	BL02	15,000	41,000	12	---	0.38
SWFTS-IW06B	11/14/2017	SWFTS-IW06B-EM06B	N	EM06	---	---	---	600 J-	---
SWFTS-IW06B	11/15/2017	SWFTS-IW06B-EM06	N	EM06	20	---	<0.55	660	0.36
SWFTS-IW07	7/11/2017	SWFTS-IW07-BL02	N	BL02	15,000	45,000	11	---	0.55
SWFTS-IW07	12/11/2017	SWFTS-IW07-EM07	N	EM07	---	---	---	5,600 J-	---
SWFTS-IW08	7/12/2017	SWFTS-IW08-BL02	N	BL02	14,000	40,000	12	---	0.79
SWFTS-IW08	12/11/2017	SWFTS-IW08-EM07	N	EM07	---	---	---	6,700 J-	---
SWFTS-IW09	7/12/2017	SWFTS-IW09-BL02	N	BL02	11,000	48,000	12	1.7	0.47
SWFTS-IW09	7/12/2017	SWFTS-IW09-BL02-FD	FD	BL02	11,000	47,000	12	1.4	---
SWFTS-IW09	12/11/2017	SWFTS-IW09-EM07	N	EM07	---	---	---	290 J-	---
SWFTS-IW10	7/12/2017	SWFTS-IW10-BL02	N	BL02	7,800	37,000	14	---	0.30
SWFTS-IW10	12/11/2017	SWFTS-IW10-EM07	N	EM07	---	---	---	290 J-	---
SWFTS-IW11	7/12/2017	SWFTS-IW11-BL02	N	BL02	5,600	6,600	2.0	2.6	0.38
SWFTS-IW11	12/11/2017	SWFTS-IW11-EM07	N	EM07	---	---	---	1,000 J-	---
SWFTS-IW12	7/12/2017	SWFTS-IW12-BL02	N	BL02	6,200	7,800	2.5	---	0.51
SWFTS-IW12	12/11/2017	SWFTS-IW12-EM07	N	EM07	---	---	---	2,700 J-	---
SWFTS-IW13A	7/11/2017	SWFTS-IW13A-BL02	N	BL02	19,000	52,000	14	---	0.54
SWFTS-IW13A	11/14/2017	SWFTS-IW13A-EM06B	N	EM06	---	---	---	3,700 J-	---
SWFTS-IW13B	7/11/2017	SWFTS-IW13B-BL02	N	BL02	21,000	53,000	12	---	0.46
SWFTS-IW13B	11/14/2017	SWFTS-IW13B-EM06B	N	EM06	---	---	---	1,100 J-	---
SWFTS-IW14	7/12/2017	SWFTS-IW14-BL02	N	BL02	21,000	51,000	42 J	1.9	0.49
SWFTS-IW14	11/14/2017	SWFTS-IW14-EM06B	N	EM06	---	---	---	4,600	---
SWFTS-IW14	11/14/2017	SWFTS-IW14-EM06B-FD	FD	EM06	---	---	---	4,500 J-	---
SWFTS-IW15	7/12/2017	SWFTS-IW15-BL02	N	BL02	15,000	44,000	13	---	0.32
SWFTS-IW15	12/11/2017	SWFTS-IW15-EM07	N	EM07	---	---	---	1,300 J-	---
SWFTS-IW15	12/11/2017	SWFTS-IW15-EM07-FD	FD	EM07	---	---	---	1,300 J-	---
SWFTS-IW16A	7/11/2017	SWFTS-IW16A-BL02	N	BL02	17,000	45,000	11	---	0.86
SWFTS-IW16A	12/11/2017	SWFTS-IW16A-EM07	N	EM07	---	---	---	2,800 J-	---
SWFTS-IW16B	7/11/2017	SWFTS-IW16B-BL02	N	BL02	15,000	44,000	12	---	0.42
SWFTS-IW16B	12/11/2017	SWFTS-IW16B-EM07	N	EM07	---	---	---	940 J-	---
SWFTS-IW17	7/13/2017	SWFTS-IW17-BL02	N	BL02	13,000	47,000	12	1.4	0.41
SWFTS-IW17	11/14/2017	SWFTS-IW17-EM06B	N	EM06	---	---	---	6,500 J-	---
SWFTS-IW17	11/15/2017	SWFTS-IW17-EM06	N	EM06	<19	---	<1.1	7,500	0.36
SWFTS-IW18	7/13/2017	SWFTS-IW18-BL02	N	BL02	14,000	47,000	12	---	0.30
SWFTS-IW18	11/14/2017	SWFTS-IW18-EM06B	N	EM06	---	---	---	1.8	---

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-IW19	7/13/2017	SWFTS-IW19-BL02	N	BL02	6,400	57,000	16	---	3.30
SWFTS-IW19	12/11/2017	SWFTS-IW19-EM07	N	EM07	---	---	---	4,100 J-	---
SWFTS-IW20	7/12/2017	SWFTS-IW20-BL02	N	BL02	4,400	31,000	17	1.0	4.23
SWFTS-IW20	11/14/2017	SWFTS-IW20-EM06B	N	EM06	---	---	---	6,500 J-	---
SWFTS-MW01	3/29/2017	SWFTS-MW01-BL01	N	BL01	15,000	49,000	12	1.6	1.07
SWFTS-MW01	9/19/2017	SWFTS-MW01-EM01	N	EM01	2,100	39,000	<0.55	11	1.38
SWFTS-MW01	9/26/2017	SWFTS-MW01-EM02	N	EM02	4,300	10,000	1.4 J	4.3	0.23
SWFTS-MW01	10/4/2017	SWFTS-MW01-EM03	N	EM03	5,000	13,000	3.3	2.5	0.20
SWFTS-MW01	10/10/2017	SWFTS-MW01-EM04	N	EM04	5,600	15,000	3.3	2.2	0.47
SWFTS-MW01	10/25/2017	SWFTS-MW01-EM05	N	EM05	15,000	18,000	5.1	2.1	0.89
SWFTS-MW01	11/15/2017	SWFTS-MW01-EM06	N	EM06	7,900	22,000	4.9	1.9	0.81
SWFTS-MW01	12/14/2017	SWFTS-MW01-EM07	N	EM07	8,000	24,000	5.3	1.9	0.20
SWFTS-MW01	2/20/2018	SWFTS-MW01-EM08	N	EM08	3,900	12,000	3.4	2.7	2.85
SWFTS-MW01	3/27/2018	SWFTS-MW01-EM09	N	EM09	6,900	26,000	5.3	1.9	2.42
SWFTS-MW01	4/30/2018	SWFTS-MW01-EM10	N	EM10	9,400	36,000	8.9	1.4	0.15
SWFTS-MW01	7/10/2018	SWFTS-MW01-EM11	N	EM11	3,100	6,900	1.4	2.4	0.04
SWFTS-MW01	7/27/2018	SWFTS-MW01-EM12	N	EM12	5,500	28,000	---	---	0.29
SWFTS-MW01	7/27/2018	SWFTS-MW01-EM12-FD	FD	EM12	5,500	28,000	---	---	---
SWFTS-MW01	8/16/2018	SWFTS-MW01-EM13	N	EM13	6,100	34,000	6.4	2.0	0.80
SWFTS-MW01	9/10/2018	SWFTS-MW01-EM14	N	EM14	6,300	34,000	8.4	1.9	6.07
SWFTS-MW01	10/9/2018	SWFTS-MW01-EM15	N	EM15	4,700 J	24,000	7.1	2.1	0.09
SWFTS-MW01	12/27/2018	SWFTS-MW01-EM16	N	EM16	4,300	7,400	9.9	1.8	0.51
SWFTS-MW02	3/29/2017	SWFTS-MW02-BL01	N	BL01	25,000	58,000	11	2.2	0.33
SWFTS-MW02	9/21/2017	SWFTS-MW02-EM01	N	EM01	23,000	52,000	8.5	2.1	0.16
SWFTS-MW02	9/27/2017	SWFTS-MW02-EM02	N	EM02	23,000	47,000	9.4	2.2	0.14
SWFTS-MW02	10/4/2017	SWFTS-MW02-EM03	N	EM03	22,000	45,000	8.7	2.0	1.76
SWFTS-MW02	10/12/2017	SWFTS-MW02-EM04	N	EM04	20,000	23,000	6.2	2.3	0.25
SWFTS-MW02	10/26/2017	SWFTS-MW02-EM05	N	EM05	21,000	34,000	4.6 J-	2.5	2.11
SWFTS-MW02	11/14/2017	SWFTS-MW02-EM06	N	EM06	17,000	32,000	6.5	2.5	0.90
SWFTS-MW02	12/13/2017	SWFTS-MW02-EM07	N	EM07	19,000	38,000	6.7	2.1	0.01
SWFTS-MW02	2/19/2018	SWFTS-MW02-EM08	N	EM08	14,000	28,000	4.7	2.5	2.59
SWFTS-MW02	3/27/2018	SWFTS-MW02-EM09	N	EM09	4,400	7,400	0.80	2.5	1.76
SWFTS-MW02	4/30/2018	SWFTS-MW02-EM10	N	EM10	4,600	6,100	0.95 J	2.3	1.59
SWFTS-MW02	7/11/2018	SWFTS-MW02-EM11	N	EM11	3,700	5,100	1.7	1.9	1.86
SWFTS-MW02	7/27/2018	SWFTS-MW02-EM12	N	EM12	2,100	3,900	---	---	0.24
SWFTS-MW02	8/15/2018	SWFTS-MW02-EM13	N	EM13	1,700	2,600	0.74 J	2.5	2.35
SWFTS-MW02	9/10/2018	SWFTS-MW02-EM14	N	EM14	1,300	2,500	<0.55	2.5	5.31
SWFTS-MW02	10/10/2018	SWFTS-MW02-EM15	N	EM15	1,400	950	<1.1	3.0	0
SWFTS-MW02	12/20/2018	SWFTS-MW02-EM16	N	EM16	620	77 J	<0.55	2.4	2.95
SWFTS-MW03	3/30/2017	SWFTS-MW03-BL01	N	BL01	9,900	47,000	13	1.6	1.64
SWFTS-MW03	3/30/2017	SWFTS-MW03-BL01-FD	FD	BL01	9,200	47,000	13	1.7	---
SWFTS-MW03	9/21/2017	SWFTS-MW03-EM01	N	EM01	<4.8	<100	<0.55	4.2	0.19
SWFTS-MW03	9/27/2017	SWFTS-MW03-EM02	N	EM02	4.8	<100	<0.55	3.0	0.11
SWFTS-MW03	10/4/2017	SWFTS-MW03-EM03	N	EM03	<0.95	<50	<0.55	2.3	1.02
SWFTS-MW03	10/12/2017	SWFTS-MW03-EM04	N	EM04	21	<100	<0.55	2.0	0.14
SWFTS-MW03	10/26/2017	SWFTS-MW03-EM05	N	EM05	990	3,200	0.73 J	2.1	1.59
SWFTS-MW03	11/16/2017	SWFTS-MW03-EM06	N	EM06	3,200	15,000	3.2	1.7	0.64



**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW03	12/12/2017	SWFTS-MW03-EM07	N	EM07	3,700	22,000	4.3	1.8	2.21
SWFTS-MW03	2/21/2018	SWFTS-MW03-EM08	N	EM08	3,400	33,000	4.2	1.7	0.30
SWFTS-MW03	3/27/2018	SWFTS-MW03-EM09	N	EM09	4,200	27,000	6.4	1.5	0.62
SWFTS-MW03	5/2/2018	SWFTS-MW03-EM10	N	EM10	4,300	30,000	7.9	1.4	0.45
SWFTS-MW03	7/10/2018	SWFTS-MW03-EM11	N	EM11	1,300	3,000	1.3	2.3	0.79
SWFTS-MW03	7/27/2018	SWFTS-MW03-EM12	N	EM12	1,900 J+	1,800	---	---	0.23
SWFTS-MW03	8/15/2018	SWFTS-MW03-EM13	N	EM13	1,900	280 J	3.6	1.9	0.48
SWFTS-MW03	9/11/2018	SWFTS-MW03-EM14	N	EM14	2,200	<10	4.9	1.5	1.84
SWFTS-MW03	10/9/2018	SWFTS-MW03-EM15	N	EM15	2,200	<20	5.9	2.0	0
SWFTS-MW03	1/2/2019	SWFTS-MW03-EM16	N	EM16	2,500	<10	7.7	1.8	0.8
SWFTS-MW04	3/31/2017	SWFTS-MW04-BL01	N	BL01	14,000	26,000	5.5	2.3	7.02
SWFTS-MW04	9/20/2017	SWFTS-MW04-EM01	N	EM01	3,600	4,900	1.3	2.6	0.85
SWFTS-MW04	9/20/2017	SWFTS-MW04-EM01-FD	FD	EM01	3,600	4,800	1.3	2.6	---
SWFTS-MW04	9/27/2017	SWFTS-MW04-EM02	N	EM02	3,600	5,400	1.5	3.1	2.73
SWFTS-MW04	9/27/2017	SWFTS-MW04-EM02-FD	FD	EM02	3,500	5,400	1.5	3.1	---
SWFTS-MW04	10/4/2017	SWFTS-MW04-EM03	N	EM03	4,000	4,700	1.5	2.7	0.11
SWFTS-MW04	10/4/2017	SWFTS-MW04-EM03-FD	FD	EM03	3,900	4,700	1.9	2.6	---
SWFTS-MW04	10/11/2017	SWFTS-MW04-EM04	N	EM04	2,900	3,900	1.3	2.7	1.39
SWFTS-MW04	10/24/2017	SWFTS-MW04-EM05	N	EM05	3,600	4,200	1.4	2.9	0.28
SWFTS-MW04	10/24/2017	SWFTS-MW04-EM05-FD	FD	EM05	3,500	4,200	1.5	3.0	---
SWFTS-MW04	11/15/2017	SWFTS-MW04-EM06	N	EM06	3,500	3,400	1.6	3.0	0.89
SWFTS-MW04	12/14/2017	SWFTS-MW04-EM07	N	EM07	4,000	4,700	1.8	2.9	0.45
SWFTS-MW04	2/21/2018	SWFTS-MW04-EM08	N	EM08	5,200	8,000	2.4	2.7	0.37
SWFTS-MW04	3/27/2018	SWFTS-MW04-EM09	N	EM09	6,100	14,000	3.5	2.5	0.43
SWFTS-MW04	5/1/2018	SWFTS-MW04-EM10	N	EM10	4,100	3,700	1.4	2.8	2.80
SWFTS-MW04	7/10/2018	SWFTS-MW04-EM11	N	EM11	6,400	15,000	4.5	2.5	0.00
SWFTS-MW04	8/16/2018	SWFTS-MW04-EM13	N	EM13	3,100	8,700	1.9 J+	2.9	0.91
SWFTS-MW04	9/12/2018	SWFTS-MW04-EM14	N	EM14	4,000	9,100	2.6	2.9	2.64
SWFTS-MW04	10/11/2018	SWFTS-MW04-EM15	N	EM15	3,400	8,300	2.0	3.0	0.84
SWFTS-MW04	1/3/2019	SWFTS-MW04-EM16	N	EM16	3,500	6,900	1.6	3.1	1.11
SWFTS-MW05A	3/30/2017	SWFTS-MW05A-BL01	N	BL01	7,400	67,000	18	1.4	4.28
SWFTS-MW05A	9/20/2017	SWFTS-MW05A-EM01	N	EM01	5,700	51,000	17	1.1	4.18
SWFTS-MW05A	9/27/2017	SWFTS-MW05A-EM02	N	EM02	5,600	44,000	18	1.2	3.30
SWFTS-MW05A	10/3/2017	SWFTS-MW05A-EM03	N	EM03	5,800	46,000	16	0.80 J	5.46
SWFTS-MW05A	10/10/2017	SWFTS-MW05A-EM04	N	EM04	5,600	44,000	16	1.3	3.41
SWFTS-MW05A	10/23/2017	SWFTS-MW05A-EM05	N	EM05	4,700	43,000	15	1.3	2.96
SWFTS-MW05A	11/14/2017	SWFTS-MW05A-EM06	N	EM06	5,500	38,000	16	1.4	2.27
SWFTS-MW05A	12/13/2017	SWFTS-MW05A-EM07	N	EM07	5,300	43,000	17	1.3	2.10
SWFTS-MW05A	2/20/2018	SWFTS-MW05A-EM08	N	EM08	6,400	53,000	18	1.4	2.78
SWFTS-MW05A	3/26/2018	SWFTS-MW05A-EM09	N	EM09	6,600	180,000	16	1.1	0.99
SWFTS-MW05A	4/30/2018	SWFTS-MW05A-EM10	N	EM10	6,400 J	55,000	17	1.0	2.16
SWFTS-MW05A	7/11/2018	SWFTS-MW05A-EM11	N	EM11	5,200	46,000	28 J	0.87 J	2.65
SWFTS-MW05A	7/27/2018	SWFTS-MW05A-EM12	N	EM12	4,300	41,000	---	---	3.46
SWFTS-MW05A	8/14/2018	SWFTS-MW05A-EM13	N	EM13	3,600	35,000	10 J+	1.5	0.93
SWFTS-MW05A	9/11/2018	SWFTS-MW05A-EM14	N	EM14	3,400	30,000	13 J	1.2	2.59
SWFTS-MW05A	10/10/2018	SWFTS-MW05A-EM15	N	EM15	4,200	34,000	12	1.3	2.08
SWFTS-MW05A	12/20/2018	SWFTS-MW05A-EM16	N	EM16	5,000	21,000	16	1.3	0.68

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW05B	3/30/2017	SWFTS-MW05B-BL01	N	BL01	7,200	48,000	13	1.5	0.70
SWFTS-MW05B	9/22/2017	SWFTS-MW05B-EM01	N	EM01	190	300	<0.55	39	0.24
SWFTS-MW05B	9/27/2017	SWFTS-MW05B-EM02	N	EM02	<0.95	<50	<0.55	57	0.10
SWFTS-MW05B	10/3/2017	SWFTS-MW05B-EM03	N	EM03	8.3	<50	<0.55	90	0.10
SWFTS-MW05B	10/10/2017	SWFTS-MW05B-EM04	N	EM04	<0.95	<100	<0.55	100	0.08
SWFTS-MW05B	10/23/2017	SWFTS-MW05B-EM05	N	EM05	<0.95	<100	<0.55	68	0.34
SWFTS-MW05B	11/14/2017	SWFTS-MW05B-EM06	N	EM06	<0.95	16 J	<0.55	3.2	0.46
SWFTS-MW05B	12/13/2017	SWFTS-MW05B-EM07	N	EM07	990	5,300	0.36 J	2.3	0.30
SWFTS-MW05B	2/20/2018	SWFTS-MW05B-EM08	N	EM08	2,000	11,000	4.2	2.2	0.34
SWFTS-MW05B	3/26/2018	SWFTS-MW05B-EM09	N	EM09	2,600	5,800	4.6	1.7	0.49
SWFTS-MW05B	4/30/2018	SWFTS-MW05B-EM10	N	EM10	2,600	18,000	5.4	1.9	0.00
SWFTS-MW05B	7/10/2018	SWFTS-MW05B-EM11	N	EM11	190	1,500	0.66 J-	2.4	1.45
SWFTS-MW05B	7/27/2018	SWFTS-MW05B-EM12	N	EM12	240	1,600	---	---	4.21
SWFTS-MW05B	8/14/2018	SWFTS-MW05B-EM13	N	EM13	420	2,000	<0.55	2.5	0.80
SWFTS-MW05B	9/11/2018	SWFTS-MW05B-EM14	N	EM14	860	4,800	1.3	1.9	2.37
SWFTS-MW05B	10/9/2018	SWFTS-MW05B-EM15	N	EM15	1,400	8,700	2.5	2.3	0
SWFTS-MW05B	12/20/2018	SWFTS-MW05B-EM16	N	EM16	2,100	8,000	4.7	2.1	0.62
SWFTS-MW06A	3/30/2017	SWFTS-MW06A-BL01	N	BL01	170	<10	<0.11	3.6	0.38
SWFTS-MW06A	9/21/2017	SWFTS-MW06A-EM01	N	EM01	2,400	220	1.5	3.0	0.16
SWFTS-MW06A	9/27/2017	SWFTS-MW06A-EM02	N	EM02	2,600	320	1.7	3.3	0.30
SWFTS-MW06A	10/3/2017	SWFTS-MW06A-EM03	N	EM03	2,700	300	2.0 J-	2.8	0.12
SWFTS-MW06A	10/11/2017	SWFTS-MW06A-EM04	N	EM04	5,500	1,100	1.9	3.0	0.37
SWFTS-MW06A	10/23/2017	SWFTS-MW06A-EM05	N	EM05	2,300	350	1.9	3.3	2.52
SWFTS-MW06A	11/16/2017	SWFTS-MW06A-EM06	N	EM06	3,300	380	2.5	2.8	0.42
SWFTS-MW06A	12/13/2017	SWFTS-MW06A-EM07	N	EM07	3,600	520	2.6	2.7	0.17
SWFTS-MW06A	2/22/2018	SWFTS-MW06A-EM08	N	EM08	1,800	200	0.88	3.4	0.37
SWFTS-MW06A	3/28/2018	SWFTS-MW06A-EM09	N	EM09	1,500	77	0.36	3.1	0.44
SWFTS-MW06A	5/1/2018	SWFTS-MW06A-EM10	N	EM10	760 J	10 J	0.11	3.1	0.27
SWFTS-MW06A	5/1/2018	SWFTS-MW06A-EM10-FD	FD	EM10	880	13 J	0.11	3.1	---
SWFTS-MW06A	7/11/2018	SWFTS-MW06A-EM11	N	EM11	830	21	0.11 J	2.9	2.40
SWFTS-MW06A	7/11/2018	SWFTS-MW06A-EM11-FD	FD	EM11	840	20	<0.11	2.9	---
SWFTS-MW06A	8/14/2018	SWFTS-MW06A-EM13	N	EM13	1,500	96	0.28	3.4	0.69
SWFTS-MW06A	8/14/2018	SWFTS-MW06A-EM13-FD	FD	EM13	1,500	95	0.29	3.3	---
SWFTS-MW06A	9/11/2018	SWFTS-MW06A-EM14	N	EM14	1,700	150	0.42	3.4	0.49
SWFTS-MW06A	9/11/2018	SWFTS-MW06A-EM14-FD	FD	EM14	1,600	140	0.43	3.3	---
SWFTS-MW06A	10/10/2018	SWFTS-MW06A-EM15	N	EM15	2,400	210	0.84	3.5	0.2
SWFTS-MW06A	10/10/2018	SWFTS-MW06A-EM15-FD	FD	EM15	2,100	210	0.79	3.6	---
SWFTS-MW06A	12/28/2018	SWFTS-MW06A-EM16	N	EM16	1,700	760	0.41	3.6	0.98
SWFTS-MW06A	12/28/2018	SWFTS-MW06A-EM16-FD	FD	EM16	1,600	760	0.42	3.5	---
SWFTS-MW06B	3/30/2017	SWFTS-MW06B-BL01	N	BL01	1,000	490	0.13 J	3.5	0.06
SWFTS-MW06B	9/21/2017	SWFTS-MW06B-EM01	N	EM01	2,000	350	0.70	2.8	0.18
SWFTS-MW06B	9/27/2017	SWFTS-MW06B-EM02	N	EM02	2,000	360	0.76	3.3	0.78
SWFTS-MW06B	10/3/2017	SWFTS-MW06B-EM03	N	EM03	2,500	340	1.0	2.8	0.11
SWFTS-MW06B	10/11/2017	SWFTS-MW06B-EM04	N	EM04	4,400	380	1.1	3.1	0.45
SWFTS-MW06B	10/23/2017	SWFTS-MW06B-EM05	N	EM05	2,000	390	1.3	3.1	1.14
SWFTS-MW06B	11/16/2017	SWFTS-MW06B-EM06	N	EM06	2,800	400	1.8	2.9	0.44
SWFTS-MW06B	12/13/2017	SWFTS-MW06B-EM07	N	EM07	3,200	590	2.2	2.9	0.91

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW06B	2/22/2018	SWFTS-MW06B-EM08	N	EM08	2,900	480	1.9	3.1	0.47
SWFTS-MW06B	3/28/2018	SWFTS-MW06B-EM09	N	EM09	2,500	370	1.1	2.8	0.59
SWFTS-MW06B	5/1/2018	SWFTS-MW06B-EM10	N	EM10	1,800	270	0.56	2.9	1.31
SWFTS-MW06B	7/11/2018	SWFTS-MW06B-EM11	N	EM11	880	140	0.18 J	2.9	2.05
SWFTS-MW06B	8/14/2018	SWFTS-MW06B-EM13	N	EM13	1,200	170	0.14	3.8	0.57
SWFTS-MW06B	9/11/2018	SWFTS-MW06B-EM14	N	EM14	1,700	230	0.23	3.3	0.71
SWFTS-MW06B	10/10/2018	SWFTS-MW06B-EM15	N	EM15	1,700	260	0.36 J	4.1	0.17
SWFTS-MW06B	12/28/2018	SWFTS-MW06B-EM16	N	EM16	1,900	270	0.66	3.1	0.7
SWFTS-MW07A	3/30/2017	SWFTS-MW07A-BL01	N	BL01	14,000	44,000	11	2.1	0.16
SWFTS-MW07A	9/20/2017	SWFTS-MW07A-EM01	N	EM01	14,000	41,000	11	2.0	0.20
SWFTS-MW07A	9/26/2017	SWFTS-MW07A-EM02	N	EM02	15,000	36,000	11	2.3	0.49
SWFTS-MW07A	10/3/2017	SWFTS-MW07A-EM03	N	EM03	16,000	37,000	10	2.1	0.22
SWFTS-MW07A	10/11/2017	SWFTS-MW07A-EM04	N	EM04	12,000	39,000	12	2.0	0.11
SWFTS-MW07A	10/24/2017	SWFTS-MW07A-EM05	N	EM05	14,000	38,000	10	2.3	0.43
SWFTS-MW07A	11/15/2017	SWFTS-MW07A-EM06	N	EM06	16,000	40,000	12	2.1	0.35
SWFTS-MW07A	12/14/2017	SWFTS-MW07A-EM07	N	EM07	14,000	35,000	11	2.1	-0.02 E
SWFTS-MW07A	2/19/2018	SWFTS-MW07A-EM08	N	EM08	12,000	36,000	12	2.2	0.72
SWFTS-MW07A	3/28/2018	SWFTS-MW07A-EM09	N	EM09	11,000	36,000	12	1.8	3.29
SWFTS-MW07A	5/2/2018	SWFTS-MW07A-EM10	N	EM10	11,000	40,000	13	1.7	1.02
SWFTS-MW07A	7/11/2018	SWFTS-MW07A-EM11	N	EM11	11,000	44,000	14	1.6	1.42
SWFTS-MW07A	8/16/2018	SWFTS-MW07A-EM13	N	EM13	8,600	76,000	15	2.0	0.58
SWFTS-MW07A	9/12/2018	SWFTS-MW07A-EM14	N	EM14	9,500	42,000	17	1.8	1.30
SWFTS-MW07A	10/10/2018	SWFTS-MW07A-EM15	N	EM15	9,300	40,000	17	2.1	0.08
SWFTS-MW07A	1/2/2019	SWFTS-MW07A-EM16	N	EM16	8,100	35,000	15	1.8	0.99
SWFTS-MW07B	3/30/2017	SWFTS-MW07B-BL01	N	BL01	13,000	40,000	11	2.0	1.29
SWFTS-MW07B	9/20/2017	SWFTS-MW07B-EM01	N	EM01	10,000	33,000	9.0	1.8	0.35
SWFTS-MW07B	9/26/2017	SWFTS-MW07B-EM02	N	EM02	11,000	29,000	10	2.2	0.60
SWFTS-MW07B	10/3/2017	SWFTS-MW07B-EM03	N	EM03	9,400	28,000	9.9	1.6	1.38
SWFTS-MW07B	10/11/2017	SWFTS-MW07B-EM04	N	EM04	8,400	28,000	11	1.7	0.13
SWFTS-MW07B	10/24/2017	SWFTS-MW07B-EM05	N	EM05	9,300	29,000	11	1.2	0.33
SWFTS-MW07B	11/15/2017	SWFTS-MW07B-EM06	N	EM06	9,700	29,000	12	2.0	0.42
SWFTS-MW07B	12/14/2017	SWFTS-MW07B-EM07	N	EM07	9,400	30,000	12	1.9	-0.09 E
SWFTS-MW07B	2/19/2018	SWFTS-MW07B-EM08	N	EM08	9,700	37,000	14	2.2	1.23
SWFTS-MW07B	3/28/2018	SWFTS-MW07B-EM09	N	EM09	11,000	47,000	16	1.7	0.30
SWFTS-MW07B	5/2/2018	SWFTS-MW07B-EM10	N	EM10	9,100	34,000	13	1.9	4.67
SWFTS-MW07B	7/11/2018	SWFTS-MW07B-EM11	N	EM11	8,300	43,000	16	1.7	1.60
SWFTS-MW07B	8/16/2018	SWFTS-MW07B-EM13	N	EM13	6,500	44,000	17	2.0	0.49
SWFTS-MW07B	9/12/2018	SWFTS-MW07B-EM14	N	EM14	6,200	31,000	17	1.8	1.69
SWFTS-MW07B	10/10/2018	SWFTS-MW07B-EM15	N	EM15	5,700	28,000	16	1.8	0.09
SWFTS-MW07B	1/3/2019	SWFTS-MW07B-EM16	N	EM16	6,100	32,000	13	1.6	1.35
SWFTS-MW08A	3/30/2017	SWFTS-MW08A-BL01	N	BL01	14,000	20,000	28 J	1.5	0.25
SWFTS-MW08A	9/20/2017	SWFTS-MW08A-EM01	N	EM01	10,000	47,000	12	1.4	0.41
SWFTS-MW08A	9/20/2017	SWFTS-MW08A-EM01-FD	FD	EM01	10,000	46,000	13	1.4	---
SWFTS-MW08A	9/26/2017	SWFTS-MW08A-EM02	N	EM02	9,800	40,000	12	1.7	0.27
SWFTS-MW08A	9/26/2017	SWFTS-MW08A-EM02-FD	FD	EM02	10,000	42,000	12	1.8	---
SWFTS-MW08A	10/5/2017	SWFTS-MW08A-EM03	N	EM03	7,800	42,000	14	1.6	4.16
SWFTS-MW08A	10/5/2017	SWFTS-MW08A-EM03-FD	FD	EM03	9,800	49,000	12	2.0	---

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW08A	10/10/2017	SWFTS-MW08A-EM04	N	EM04	9,500	43,000	12	1.6	44.01 E
SWFTS-MW08A	10/23/2017	SWFTS-MW08A-EM05	N	EM05	8,100	41,000	14	1.8	1.49
SWFTS-MW08A	10/23/2017	SWFTS-MW08A-EM05-FD	FD	EM05	8,100	40,000	12	1.8	---
SWFTS-MW08A	11/15/2017	SWFTS-MW08A-EM06	N	EM06	9,000	43,000	14	1.6	0.60
SWFTS-MW08A	12/14/2017	SWFTS-MW08A-EM07	N	EM07	8,900	45,000	14	1.6	0.11
SWFTS-MW08A	2/22/2018	SWFTS-MW08A-EM08	N	EM08	9,500	54,000	14	1.9	5.05
SWFTS-MW08A	3/29/2018	SWFTS-MW08A-EM09	N	EM09	9,100	59,000	15	1.5	2.61
SWFTS-MW08A	5/3/2018	SWFTS-MW08A-EM10	N	EM10	9,100	55,000	17	1.5	0.37
SWFTS-MW08A	7/11/2018	SWFTS-MW08A-EM11	N	EM11	7,500	63,000	15	1.3	1.54
SWFTS-MW08A	8/16/2018	SWFTS-MW08A-EM13	N	EM13	5,500	47,000	15	1.8	0.63
SWFTS-MW08A	9/12/2018	SWFTS-MW08A-EM14	N	EM14	5,600	43,000	15	1.6	0.77
SWFTS-MW08A	10/10/2018	SWFTS-MW08A-EM15	N	EM15	5,500	42,000	15	1.8	0.09
SWFTS-MW08A	1/2/2019	SWFTS-MW08A-EM16	N	EM16	7,200	45,000	15	2.0	1.23
SWFTS-MW08C	3/28/2017	SWFTS-MW08C-BL01	N	BL01	7,800	55,000	13	1.3	0.08
SWFTS-MW08C	12/14/2017	SWFTS-MW08C-EM07	N	EM07	9,300	50,000	13	1.1	-0.06 E
SWFTS-MW09A	3/29/2017	SWFTS-MW09A-BL01	N	BL01	14,000	50,000	13	1.6	0.33
SWFTS-MW09A	9/21/2017	SWFTS-MW09A-EM01	N	EM01	3,400	1,200	<0.55	51	0.57
SWFTS-MW09A	9/28/2017	SWFTS-MW09A-EM02	N	EM02	54	<100	<0.55	40	0.26
SWFTS-MW09A	10/4/2017	SWFTS-MW09A-EM03	N	EM03	420	200	<0.55	22	4.54
SWFTS-MW09A	10/11/2017	SWFTS-MW09A-EM04	N	EM04	8.4 J+	55	<0.55	7.5	0.12
SWFTS-MW09A	10/25/2017	SWFTS-MW09A-EM05	N	EM05	1,300	1,700	<0.55	2.9	0.31
SWFTS-MW09A	11/16/2017	SWFTS-MW09A-EM06	N	EM06	3,400	8,400	1.2	2.1	1.88
SWFTS-MW09A	12/12/2017	SWFTS-MW09A-EM07	N	EM07	5,400	16,000	2.7	2.1	0.29
SWFTS-MW09A	2/20/2018	SWFTS-MW09A-EM08	N	EM08	6,800	16,000	5.3	2.1	4.16
SWFTS-MW09A	3/27/2018	SWFTS-MW09A-EM09	N	EM09	6,700	18,000	6.4	1.8	2.12
SWFTS-MW09A	5/1/2018	SWFTS-MW09A-EM10	N	EM10	7,300	19,000	8.0	1.6	0.00
SWFTS-MW09A	7/12/2018	SWFTS-MW09A-EM11	N	EM11	2,800	2,700	3.1	2.0	1.86
SWFTS-MW09A	7/27/2018	SWFTS-MW09A-EM12	N	EM12	1,900	1,600	---	---	5.97
SWFTS-MW09A	8/14/2018	SWFTS-MW09A-EM13	N	EM13	7,200	7,600	4.5	2.2	2.83
SWFTS-MW09A	9/11/2018	SWFTS-MW09A-EM14	N	EM14	4,000	13,000	6.5	1.7	1.72
SWFTS-MW09A	10/9/2018	SWFTS-MW09A-EM15	N	EM15	4,600	15,000	7.7	2.0	1.3
SWFTS-MW09A	12/27/2018	SWFTS-MW09A-EM16	N	EM16	3,600	14,000	9.1	1.8	0.83
SWFTS-MW09B	3/29/2017	SWFTS-MW09B-BL01	N	BL01	13,000	46,000	12	1.8	0.31
SWFTS-MW09B	3/29/2017	SWFTS-MW09B-BL01-FD	FD	BL01	15,000	46,000	12	1.8	---
SWFTS-MW09B	9/21/2017	SWFTS-MW09B-EM01	N	EM01	220	390	<0.55	30	1.81
SWFTS-MW09B	9/28/2017	SWFTS-MW09B-EM02	N	EM02	990	2,500	<0.55	25	0.38
SWFTS-MW09B	10/4/2017	SWFTS-MW09B-EM03	N	EM03	430	1,000	<1.1	29	3.71
SWFTS-MW09B	10/11/2017	SWFTS-MW09B-EM04	N	EM04	1,400	3,000	1.1	18	0.12
SWFTS-MW09B	10/25/2017	SWFTS-MW09B-EM05	N	EM05	2,700	7,700	1.7	2.4	0.38
SWFTS-MW09B	11/16/2017	SWFTS-MW09B-EM06	N	EM06	2,400	8,600	2.1	2.1	0.77
SWFTS-MW09B	12/12/2017	SWFTS-MW09B-EM07	N	EM07	3,500	13,000	3.4	2.1	0.07
SWFTS-MW09B	2/20/2018	SWFTS-MW09B-EM08	N	EM08	800	1,400	<1.1	2.5	5.47
SWFTS-MW09B	3/27/2018	SWFTS-MW09B-EM09	N	EM09	7,700	28,000	5.9	1.8	2.09
SWFTS-MW09B	4/30/2018	SWFTS-MW09B-EM10	N	EM10	7,400	23,000	7.9	1.8	0.00
SWFTS-MW09B	7/12/2018	SWFTS-MW09B-EM11	N	EM11	6,500	15,000	7.0	1.9	1.58
SWFTS-MW09B	7/26/2018	SWFTS-MW09B-EM12	N	EM12	6,600	20,000	---	---	1.16
SWFTS-MW09B	8/14/2018	SWFTS-MW09B-EM13	N	EM13	6,400	24,000	9.7	2.1	2.99

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW09B	9/11/2018	SWFTS-MW09B-EM14	N	EM14	6,600	28,000	11	1.6	1.12
SWFTS-MW09B	10/9/2018	SWFTS-MW09B-EM15	N	EM15	6,500	24,000	10	2.0	0.58
SWFTS-MW09B	12/28/2018	SWFTS-MW09B-EM16	N	EM16	5,500	21,000	11	1.7	1.3
SWFTS-MW10A	3/31/2017	SWFTS-MW10A-BL01	N	BL01	13,000	27,000	5.1	2.8	2.70
SWFTS-MW10A	9/21/2017	SWFTS-MW10A-EM01	N	EM01	1.9 J	<50	<0.55	23	0.42
SWFTS-MW10A	9/27/2017	SWFTS-MW10A-EM02	N	EM02	100	<100	0.66 J	12	5.10
SWFTS-MW10A	10/4/2017	SWFTS-MW10A-EM03	N	EM03	14	<100	<0.28	10	4.56
SWFTS-MW10A	10/12/2017	SWFTS-MW10A-EM04	N	EM04	<0.95	13 J	<0.11	13	0.15
SWFTS-MW10A	10/24/2017	SWFTS-MW10A-EM05	N	EM05	14	630	<0.28	6.3	1.38
SWFTS-MW10A	11/16/2017	SWFTS-MW10A-EM06	N	EM06	11	<50	<0.28	4.2	0.60
SWFTS-MW10A	11/16/2017	SWFTS-MW10A-EM06-FD	FD	EM06	15	<50	<0.28	4.0	---
SWFTS-MW10A	12/12/2017	SWFTS-MW10A-EM07	N	EM07	160	190	<0.28	3.2	0.53
SWFTS-MW10A	12/12/2017	SWFTS-MW10A-EM07-FD	FD	EM07	170	180	<0.28	3.4	---
SWFTS-MW10A	2/20/2018	SWFTS-MW10A-EM08	N	EM08	990	1,400	<1.1	3.2	0.44
SWFTS-MW10A	2/20/2018	SWFTS-MW10A-EM08-FD	FD	EM08	1,000	1,300	1.3 J	3.3	---
SWFTS-MW10A	3/26/2018	SWFTS-MW10A-EM09	N	EM09	2,300	4,000	0.37 J	2.8	1.15
SWFTS-MW10A	3/26/2018	SWFTS-MW10A-EM09-FD	FD	EM09	2,200	4,000	0.36 J	2.8 J-	---
SWFTS-MW10A	5/1/2018	SWFTS-MW10A-EM10	N	EM10	4,300	4,800	0.96 J	2.5	0.83
SWFTS-MW10A	7/11/2018	SWFTS-MW10A-EM11	N	EM11	3,000 J-	40 J	0.89 J	2.2	2.42
SWFTS-MW10A	7/26/2018	SWFTS-MW10A-EM12	N	EM12	1,300	<10	---	---	0.55
SWFTS-MW10A	8/14/2018	SWFTS-MW10A-EM13	N	EM13	1,500	<10	<0.55	3.0	2.59
SWFTS-MW10A	9/10/2018	SWFTS-MW10A-EM14	N	EM14	1,500	<10	<0.55	2.9	0.37
SWFTS-MW10A	10/9/2018	SWFTS-MW10A-EM15	N	EM15	2,300	<20	<0.55	2.8	0.86
SWFTS-MW10A	12/20/2018	SWFTS-MW10A-EM16	N	EM16	3,000	83	1.3	3.4	0.7
SWFTS-MW10C	3/28/2017	SWFTS-MW10C-BL01	N	BL01	8,300	39,000	7.6	1.5	0.09
SWFTS-MW10C	12/12/2017	SWFTS-MW10C-EM07	N	EM07	9,200	38,000	8.4	1.3	0.51
SWFTS-MW11	7/12/2017	SWFTS-MW11-BL02	N	BL02	13,000 J+	41,000	12	1.8	4.30
SWFTS-MW11	9/20/2017	SWFTS-MW11-EM01	N	EM01	13,000	40,000	11	1.7	1.86
SWFTS-MW11	9/26/2017	SWFTS-MW11-EM02	N	EM02	14,000	37,000	12	2.1	1.47
SWFTS-MW11	10/3/2017	SWFTS-MW11-EM03	N	EM03	13,000	36,000	12	1.8	0.93
SWFTS-MW11	10/11/2017	SWFTS-MW11-EM04	N	EM04	16,000	38,000	11	1.6	1.15
SWFTS-MW11	10/24/2017	SWFTS-MW11-EM05	N	EM05	13,000	36,000	12	5.7	2.32
SWFTS-MW11	11/16/2017	SWFTS-MW11-EM06	N	EM06	14,000	37,000	12	1.7	0.95
SWFTS-MW11	12/14/2017	SWFTS-MW11-EM07	N	EM07	12,000	40,000	11	2.0	1.78
SWFTS-MW11	2/21/2018	SWFTS-MW11-EM08	N	EM08	12,000	45,000	14	1.7	7.35
SWFTS-MW11	2/21/2018	SWFTS-MW11-EM08-FD	FD	EM08	12,000	46,000	13	1.9	---
SWFTS-MW11	3/28/2018	SWFTS-MW11-EM09	N	EM09	13,000	49,000	14	1.5	4.05
SWFTS-MW11	3/28/2018	SWFTS-MW11-EM09-FD	FD	EM09	13,000	49,000	14	1.5	---
SWFTS-MW11	5/1/2018	SWFTS-MW11-EM10	N	EM10	13,000	52,000	14	1.5	5.35
SWFTS-MW11	5/1/2018	SWFTS-MW11-EM10-FD	FD	EM10	12,000	48,000	14	1.4	---
SWFTS-MW11	7/12/2018	SWFTS-MW11-EM11	N	EM11	11,000	52,000	16	1.2	5.48
SWFTS-MW11	7/12/2018	SWFTS-MW11-EM11-FD	FD	EM11	11,000	52,000	16	1.2	---
SWFTS-MW11	8/16/2018	SWFTS-MW11-EM13	N	EM13	9,400	53,000	16	1.7	2.83
SWFTS-MW11	8/16/2018	SWFTS-MW11-EM13-FD	FD	EM13	9,600	52,000	16	1.8	---
SWFTS-MW11	9/12/2018	SWFTS-MW11-EM14	N	EM14	11,000	52,000	16	1.5	4.18
SWFTS-MW11	9/12/2018	SWFTS-MW11-EM14-FD	FD	EM14	11,000	52,000	16	1.4	---
SWFTS-MW11	10/11/2018	SWFTS-MW11-EM15	N	EM15	10,000	54,000	17	1.6	3.59

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW11	10/11/2018	SWFTS-MW11-EM15-FD	FD	EM15	11,000	52,000	17	1.7	---
SWFTS-MW11	1/2/2019	SWFTS-MW11-EM16	N	EM16	8,600	44,000	16	1.5	7.08
SWFTS-MW11	1/2/2019	SWFTS-MW11-EM16-FD	FD	EM16	8,400	45,000	16	1.5	---
SWFTS-MW12	7/13/2017	SWFTS-MW12-BL02	N	BL02	5,100	37,000	16	0.88 J	7.81
SWFTS-MW12	9/19/2017	SWFTS-MW12-EM01	N	EM01	5,100	360,000	14	1.1	4.36
SWFTS-MW12	9/26/2017	SWFTS-MW12-EM02	N	EM02	4,900	34,000	14	1.6	2.98
SWFTS-MW12	10/3/2017	SWFTS-MW12-EM03	N	EM03	5,400	34,000	14 J-	0.78 J	2.77
SWFTS-MW12	10/11/2017	SWFTS-MW12-EM04	N	EM04	4,800	35,000	13	0.93 J	1.59
SWFTS-MW12	10/24/2017	SWFTS-MW12-EM05	N	EM05	5,000	37,000	14	1.2	5.09
SWFTS-MW12	11/14/2017	SWFTS-MW12-EM06	N	EM06	4,700	33,000	14	0.99 J	2.52
SWFTS-MW12	12/14/2017	SWFTS-MW12-EM07	N	EM07	4,900	30,000	13	1.5	4.37
SWFTS-MW12	2/22/2018	SWFTS-MW12-EM08	N	EM08	4,500	26,000	12	1.6	5.95
SWFTS-MW12	3/28/2018	SWFTS-MW12-EM09	N	EM09	6,400	39,000	14	1.3	4.30
SWFTS-MW12	5/3/2018	SWFTS-MW12-EM10	N	EM10	4,200	28,000	13	0.89 J	2.24
SWFTS-MW12	7/12/2018	SWFTS-MW12-EM11	N	EM11	4,600	35,000	13	0.69 J	5.35
SWFTS-MW12	8/16/2018	SWFTS-MW12-EM13	N	EM13	4,000	86,000	14	1.2	2.75
SWFTS-MW12	9/12/2018	SWFTS-MW12-EM14	N	EM14	4,800	36,000	14	1.1	3.46
SWFTS-MW12	10/11/2018	SWFTS-MW12-EM15	N	EM15	4,200	28,000	14	1.3	5.11
SWFTS-MW12	1/2/2019	SWFTS-MW12-EM16	N	EM16	5,800	55,000	17	1.2	4.35
SWFTS-MW13	7/12/2017	SWFTS-MW13-BL02	N	BL02	4,600	40,000	12	1.6	4.72
SWFTS-MW13	9/20/2017	SWFTS-MW13-EM01	N	EM01	10,000	52,000	17	1.1	5.20
SWFTS-MW13	9/26/2017	SWFTS-MW13-EM02	N	EM02	6,200	53,000	18	1.4	3.17
SWFTS-MW13	10/3/2017	SWFTS-MW13-EM03	N	EM03	6,900	100	17 J-	1.1	5.57
SWFTS-MW13	10/10/2017	SWFTS-MW13-EM04	N	EM04	6,300	51,000	16	0.98 J	2.40
SWFTS-MW13	10/24/2017	SWFTS-MW13-EM05	N	EM05	6,100	52,000	19	1.3	6.62
SWFTS-MW13	11/15/2017	SWFTS-MW13-EM06	N	EM06	5,900	49,000	16	0.93 J	3.22
SWFTS-MW13	12/14/2017	SWFTS-MW13-EM07	N	EM07	6,200	49,000	16	1.2	3.79
SWFTS-MW13	2/22/2018	SWFTS-MW13-EM08	N	EM08	5,800	50,000	15	1.5	4.95
SWFTS-MW13	3/26/2018	SWFTS-MW13-EM09	N	EM09	6,400	52,000	16 J+	1.2	2.98
SWFTS-MW13	5/3/2018	SWFTS-MW13-EM10	N	EM10	6,000	49,000	18	1.1	8.17 E
SWFTS-MW13	7/12/2018	SWFTS-MW13-EM11	N	EM11	6,300	49,000	16	0.80 J	6.45
SWFTS-MW13	8/16/2018	SWFTS-MW13-EM13	N	EM13	5,200	21,000	17	1.3	2.95
SWFTS-MW13	9/13/2018	SWFTS-MW13-EM14	N	EM14	5,000	48,000	16	1.2	3.44
SWFTS-MW13	10/11/2018	SWFTS-MW13-EM15	N	EM15	5,800	55,000	17	1.2	3.49
SWFTS-MW13	1/2/2019	SWFTS-MW13-EM16	N	EM16	3,900	28,000	13	1.1	6.89
SWFTS-MW14	7/12/2017	SWFTS-MW14-BL02	N	BL02	23,000	54,000	12	2.6	0.65
SWFTS-MW14	7/12/2017	SWFTS-MW14-BL02-FD	FD	BL02	22,000	52,000	12	2.3	---
SWFTS-MW14	9/20/2017	SWFTS-MW14-EM01	N	EM01	<9.5	<100	<0.55	100	0.39
SWFTS-MW14	9/26/2017	SWFTS-MW14-EM02	N	EM02	<4.8	2,400	<1.1	81	0.17
SWFTS-MW14	10/3/2017	SWFTS-MW14-EM03	N	EM03	4.8	<100	<0.55 UJ	36	0.19
SWFTS-MW14	10/11/2017	SWFTS-MW14-EM04	N	EM04	<9.5	<50	<0.55	4.1	0.39
SWFTS-MW14	10/27/2017	SWFTS-MW14-EM05	N	EM05	26	<50	<0.28	3.5	0.60
SWFTS-MW14	11/15/2017	SWFTS-MW14-EM06	N	EM06	20 J+	<50	<0.55	3.1	0.83
SWFTS-MW14	12/12/2017	SWFTS-MW14-EM07	N	EM07	1,600	2,400	<0.55	2.6	6.49
SWFTS-MW14	2/20/2018	SWFTS-MW14-EM08	N	EM08	2,200	<100	<1.1	670	3.12
SWFTS-MW14	3/26/2018	SWFTS-MW14-EM09	N	EM09	5,500	<50	<0.28	220	4.03
SWFTS-MW14	4/30/2018	SWFTS-MW14-EM10	N	EM10	4,300	26 J	<0.55	91	0.45

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW14	7/10/2018	SWFTS-MW14-EM11	N	EM11	6.5	<25	<0.55	180	0.90
SWFTS-MW14	7/26/2018	SWFTS-MW14-EM12	N	EM12	<95	<10	---	---	2.26
SWFTS-MW14	8/14/2018	SWFTS-MW14-EM13	N	EM13	8.2 J	<10	<0.55	130	0.47
SWFTS-MW14	9/11/2018	SWFTS-MW14-EM14	N	EM14	6.4 J	<10	<0.55	91	0.25
SWFTS-MW14	10/9/2018	SWFTS-MW14-EM15	N	EM15	<0.95	<20	<1.1	80	0.81
SWFTS-MW14	12/20/2018	SWFTS-MW14-EM16	N	EM16	<0.95	<10	<0.28	16	0.46
SWFTS-MW15	7/13/2017	SWFTS-MW15-BL02	N	BL02	15,000	43,000	10	1.6	0.47
SWFTS-MW15	9/20/2017	SWFTS-MW15-EM01	N	EM01	11,000	40,000	10	1.6	0.27
SWFTS-MW15	9/26/2017	SWFTS-MW15-EM02	N	EM02	12,000	41,000	11	1.5	0.30
SWFTS-MW15	10/4/2017	SWFTS-MW15-EM03	N	EM03	11,000	39,000	12	1.4	0.38
SWFTS-MW15	10/10/2017	SWFTS-MW15-EM04	N	EM04	18,000	40,000	11	1.6	0.21
SWFTS-MW15	10/27/2017	SWFTS-MW15-EM05	N	EM05	13,000	38,000	13	1.8	0.78
SWFTS-MW15	11/14/2017	SWFTS-MW15-EM06	N	EM06	9,900	38,000	12	1.8	1.08
SWFTS-MW15	12/13/2017	SWFTS-MW15-EM07	N	EM07	13,000	38,000	12	1.6	3.83
SWFTS-MW15	2/19/2018	SWFTS-MW15-EM08	N	EM08	12,000	47,000	11	1.6	3.24
SWFTS-MW15	3/26/2018	SWFTS-MW15-EM09	N	EM09	12,000	52,000	12	1.7	5.95
SWFTS-MW15	5/2/2018	SWFTS-MW15-EM10	N	EM10	13,000	59,000	14	1.4	1.09
SWFTS-MW15	7/11/2018	SWFTS-MW15-EM11	N	EM11	9,300	45,000	12 J-	3.5	6.10
SWFTS-MW15	7/26/2018	SWFTS-MW15-EM12	N	EM12	6,800	39,000	---	---	2.73
SWFTS-MW15	8/15/2018	SWFTS-MW15-EM13	N	EM13	9,000	52,000	16	1.9	0.97
SWFTS-MW15	9/11/2018	SWFTS-MW15-EM14	N	EM14	7,800	48,000	16	1.4	0.73
SWFTS-MW15	10/9/2018	SWFTS-MW15-EM15	N	EM15	6,400	28,000	7.5	3.3	1.09
SWFTS-MW15	12/20/2018	SWFTS-MW15-EM16	N	EM16	5,300	33,000	9.4	1.8	0.91
SWFTS-MW16	7/13/2017	SWFTS-MW16-BL02	N	BL02	8,400	38,000	12	1.6	0.93
SWFTS-MW16	9/22/2017	SWFTS-MW16-EM01	N	EM01	1,700	8,700	3.3	120	0.71
SWFTS-MW16	9/26/2017	SWFTS-MW16-EM02	N	EM02	1,300	8,800	3.8	68	1.54
SWFTS-MW16	10/3/2017	SWFTS-MW16-EM03	N	EM03	1,600	6,300	2.7	92	1.30
SWFTS-MW16	10/12/2017	SWFTS-MW16-EM04	N	EM04	1,100	5,800	2.1	180	1.32
SWFTS-MW16	10/24/2017	SWFTS-MW16-EM05	N	EM05	830	4,700	1.5	180	1.03
SWFTS-MW16	11/16/2017	SWFTS-MW16-EM06	N	EM06	<0.95	4,000	1.2	110	0.49
SWFTS-MW16	12/12/2017	SWFTS-MW16-EM07	N	EM07	490	3,100	1.1	5.9	0.56
SWFTS-MW16	2/21/2018	SWFTS-MW16-EM08	N	EM08	620	2,800	<1.1	7.7	0.49
SWFTS-MW16	3/27/2018	SWFTS-MW16-EM09	N	EM09	9,000	46,000	12	1.5	0.49
SWFTS-MW16	5/2/2018	SWFTS-MW16-EM10	N	EM10	1,500 J	11,000	3.5	2.3	0.15
SWFTS-MW16	7/11/2018	SWFTS-MW16-EM11	N	EM11	<4.8	<5.0	<0.55	7.9	5.38
SWFTS-MW16	7/26/2018	SWFTS-MW16-EM12	N	EM12	<0.95	<4.0	---	---	1.99
SWFTS-MW16	8/15/2018	SWFTS-MW16-EM13	N	EM13	12	67	<0.28	3.2	0.98
SWFTS-MW16	9/10/2018	SWFTS-MW16-EM14	N	EM14	200	1,400	0.42 J	2.9	0.78
SWFTS-MW16	10/11/2018	SWFTS-MW16-EM15	N	EM15	340	2,200	0.76 J	2.8	3.73
SWFTS-MW16	12/19/2018	SWFTS-MW16-EM16	N	EM16	270	2,300	1.0 J	2.5	0.4
SWFTS-MW17	7/12/2017	SWFTS-MW17-BL02	N	BL02	3,200	---	16	1.1	4.30
SWFTS-MW17	9/19/2017	SWFTS-MW17-EM01	N	EM01	2,600	180,000	16	1.2	5.07
SWFTS-MW17	9/19/2017	SWFTS-MW17-EM01-FD	FD	EM01	2,600	180,000	16	1.3	---
SWFTS-MW17	9/26/2017	SWFTS-MW17-EM02	N	EM02	2,800	17,000	17	1.5	4.04
SWFTS-MW17	9/26/2017	SWFTS-MW17-EM02-FD	FD	EM02	2,800	17,000	17	1.5	---
SWFTS-MW17	10/3/2017	SWFTS-MW17-EM03	N	EM03	3,300	19,000	15	1.1	6.87
SWFTS-MW17	10/3/2017	SWFTS-MW17-EM03-FD	FD	EM03	3,300	19,000	16	1.0	---

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW17	10/10/2017	SWFTS-MW17-EM04	N	EM04	2,800	16,000	16	1.3	3.90
SWFTS-MW17	10/24/2017	SWFTS-MW17-EM05	N	EM05	2,700	15,000	17	1.2	5.28
SWFTS-MW17	10/24/2017	SWFTS-MW17-EM05-FD	FD	EM05	2,700	15,000	16	2.2	---
SWFTS-MW17	11/15/2017	SWFTS-MW17-EM06	N	EM06	2,300	16,000	17	1.3	4.91
SWFTS-MW17	11/15/2017	SWFTS-MW17-EM06-FD	FD	EM06	2,200	15,000	17	1.2	---
SWFTS-MW17	12/13/2017	SWFTS-MW17-EM07	N	EM07	2,200	14,000	16	1.2	5.54
SWFTS-MW17	12/13/2017	SWFTS-MW17-EM07-FD	FD	EM07	2,300	13,000	16	1.2	---
SWFTS-MW17	2/22/2018	SWFTS-MW17-EM08	N	EM08	2,000	15,000	16	2.1	3.65
SWFTS-MW17	3/28/2018	SWFTS-MW17-EM09	N	EM09	2,000	14,000	15	1.2	3.49
SWFTS-MW17	5/3/2018	SWFTS-MW17-EM10	N	EM10	1,900 J-	11,000	15	1.1	4.08
SWFTS-MW17	7/11/2018	SWFTS-MW17-EM11	N	EM11	1,300	11,000	15	1.1	4.35
SWFTS-MW17	8/16/2018	SWFTS-MW17-EM13	N	EM13	1,600	12,000	16	1.4	4.56
SWFTS-MW17	9/12/2018	SWFTS-MW17-EM14	N	EM14	1,900	13,000	15	1.0	3.49
SWFTS-MW17	10/11/2018	SWFTS-MW17-EM15	N	EM15	2,100	15,000	16	1.6	3.33
SWFTS-MW17	1/2/2019	SWFTS-MW17-EM16	N	EM16	1,700	11,000	15	1.2	6.18
SWFTS-MW18	7/11/2017	SWFTS-MW18-BL02	N	BL02	13,000	52,000	12	1.5	2.68
SWFTS-MW18	9/21/2017	SWFTS-MW18-EM01	N	EM01	9,700	34,000	8.9	2.0	0.59
SWFTS-MW18	9/27/2017	SWFTS-MW18-EM02	N	EM02	11,000	36,000	12	2.2	0.40
SWFTS-MW18	10/3/2017	SWFTS-MW18-EM03	N	EM03	8,100	30,000	8.6	1.5	2.22
SWFTS-MW18	10/10/2017	SWFTS-MW18-EM04	N	EM04	9,700	40,000	12	1.7	0.31
SWFTS-MW18	10/23/2017	SWFTS-MW18-EM05	N	EM05	8,200	38,000	12	1.7	0.98
SWFTS-MW18	11/15/2017	SWFTS-MW18-EM06	N	EM06	11,000	37,000	11	1.8	1.37
SWFTS-MW18	12/13/2017	SWFTS-MW18-EM07	N	EM07	9,100	39,000	12	1.6	0.40
SWFTS-MW18	2/22/2018	SWFTS-MW18-EM08	N	EM08	8,900	45,000	12	2.3	0.51
SWFTS-MW18	3/27/2018	SWFTS-MW18-EM09	N	EM09	2,000	11,000	3.9	2.5	0.25
SWFTS-MW18	3/27/2018	SWFTS-MW18-EM09-FD	FD	EM09	2,100	11,000	3.5	2.4	---
SWFTS-MW18	5/1/2018	SWFTS-MW18-EM10	N	EM10	9,200	50,000	13	1.5	0.43
SWFTS-MW18	7/11/2018	SWFTS-MW18-EM11	N	EM11	6,900	41,000	11	1.6	0.01
SWFTS-MW18	7/26/2018	SWFTS-MW18-EM12	N	EM12	6,100	43,000	---	---	2.81
SWFTS-MW18	8/15/2018	SWFTS-MW18-EM13	N	EM13	5,900	41,000	13	2.0	0.58
SWFTS-MW18	9/11/2018	SWFTS-MW18-EM14	N	EM14	5,600	41,000	13	1.6	0.79
SWFTS-MW18	10/11/2018	SWFTS-MW18-EM15	N	EM15	5,300	41,000	13	2.1	1.88
SWFTS-MW18	12/20/2018	SWFTS-MW18-EM16	N	EM16	5,000	38,000	15	1.8	0.67
SWFTS-MW19	7/12/2017	SWFTS-MW19-BL02	N	BL02	840	130	0.33	2.6	0.77
SWFTS-MW19	9/21/2017	SWFTS-MW19-EM01	N	EM01	1,400	220	0.51	2.3	0.43
SWFTS-MW19	9/28/2017	SWFTS-MW19-EM02	N	EM02	1,400	260	0.74	2.8	6.39
SWFTS-MW19	10/5/2017	SWFTS-MW19-EM03	N	EM03	1,400	220	0.63	2.6	5.16
SWFTS-MW19	10/12/2017	SWFTS-MW19-EM04	N	EM04	1,400	220 J+	0.70	2.2	0.28
SWFTS-MW19	10/27/2017	SWFTS-MW19-EM05	N	EM05	1,900	250	0.77	2.6	0.38
SWFTS-MW19	11/16/2017	SWFTS-MW19-EM06	N	EM06	1,500	270	0.97	2.3	0.73
SWFTS-MW19	12/12/2017	SWFTS-MW19-EM07	N	EM07	2,000	410	1.2	2.4	0.92
SWFTS-MW19	2/20/2018	SWFTS-MW19-EM08	N	EM08	1,900	610	0.73	2.6	1.25
SWFTS-MW19	3/27/2018	SWFTS-MW19-EM09	N	EM09	1,800	650	0.71	2.2	1.09
SWFTS-MW19	4/30/2018	SWFTS-MW19-EM10	N	EM10	1,800	820	0.70	2.2	0.56
SWFTS-MW19	4/30/2018	SWFTS-MW19-EM10-FD	FD	EM10	1,700	760	0.67	2.2	---
SWFTS-MW19	7/10/2018	SWFTS-MW19-EM11	N	EM11	2,000	1,100	0.52	1.9	2.80
SWFTS-MW19	7/10/2018	SWFTS-MW19-EM11-FD	FD	EM11	2,000	1,000	0.52	1.9	---



**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW19	7/26/2018	SWFTS-MW19-EM12	N	EM12	1,800	890	---	---	1.11
SWFTS-MW19	7/26/2018	SWFTS-MW19-EM12-FD	FD	EM12	1,700	890	---	---	---
SWFTS-MW19	8/15/2018	SWFTS-MW19-EM13	N	EM13	1,700	900	0.44	2.4	0.95
SWFTS-MW19	9/11/2018	SWFTS-MW19-EM14	N	EM14	1,500	850	0.37	2.0	1.06
SWFTS-MW19	10/9/2018	SWFTS-MW19-EM15	N	EM15	2,000	870	0.41 J	2.4	1.43
SWFTS-MW19	10/9/2018	SWFTS-MW19-EM15-FD	FD	EM15	1,700	870	0.40 J	2.4	---
SWFTS-MW19	12/27/2018	SWFTS-MW19-EM16	N	EM16	1,400	760	0.36	2.4	1.43
SWFTS-MW19	12/27/2018	SWFTS-MW19-EM16-FD	FD	EM16	1,300	760	0.36	2.1	---
SWFTS-MW20	7/12/2017	SWFTS-MW20-BL02	N	BL02	20,000	51,000	13	1.7	6.05
SWFTS-MW20	9/21/2017	SWFTS-MW20-EM01	N	EM01	17,000	30,000	7.3	2.5	3.72
SWFTS-MW20	9/26/2017	SWFTS-MW20-EM02	N	EM02	16,000	33,000	7.6	3.0	0.49
SWFTS-MW20	10/4/2017	SWFTS-MW20-EM03	N	EM03	19,000	38,000	9.6	2.6	0.22
SWFTS-MW20	10/12/2017	SWFTS-MW20-EM04	N	EM04	14,000	42,000	8.5	2.2	0.23
SWFTS-MW20	10/12/2017	SWFTS-MW20-EM04-FD	FD	EM04	14,000	40,000	9.1	2.2	---
SWFTS-MW20	10/25/2017	SWFTS-MW20-EM05	N	EM05	17,000	40,000	11	2.6	0.45
SWFTS-MW20	11/16/2017	SWFTS-MW20-EM06	N	EM06	7,900	16,000	4.0	3.0	0.74
SWFTS-MW20	12/12/2017	SWFTS-MW20-EM07	N	EM07	16,000	43,000	8.5	2.2	0.20
SWFTS-MW20	2/19/2018	SWFTS-MW20-EM08	N	EM08	6,600	16,000	3.2	2.5	2.54
SWFTS-MW20	3/27/2018	SWFTS-MW20-EM09	N	EM09	11,000	24,000	5.2	2.2	3.64
SWFTS-MW20	4/30/2018	SWFTS-MW20-EM10	N	EM10	6,700	14,000	3.3	2.3	0.19
SWFTS-MW20	7/11/2018	SWFTS-MW20-EM11	N	EM11	6,700	16,000	3.2	2.8	1.72
SWFTS-MW20	7/26/2018	SWFTS-MW20-EM12	N	EM12	7,500	19,000	---	---	1.88
SWFTS-MW20	8/15/2018	SWFTS-MW20-EM13	N	EM13	4,300	5,600	2.8	2.8	0.81
SWFTS-MW20	8/15/2018	SWFTS-MW20-EM13-FD	FD	EM13	4,300	5,700	2.7	2.8	---
SWFTS-MW20	9/11/2018	SWFTS-MW20-EM14	N	EM14	3,400	8,500	2.3 J	2.6	0.51
SWFTS-MW20	9/11/2018	SWFTS-MW20-EM14-FD	FD	EM14	3,900	9,500	6.9 J	2.6	---
SWFTS-MW20	10/9/2018	SWFTS-MW20-EM15	N	EM15	4,000	5,900	2.2	3.0	1.96
SWFTS-MW20	12/20/2018	SWFTS-MW20-EM16	N	EM16	2,800	830	2.1	2.8	0.97
SWFTS-MW21	7/13/2017	SWFTS-MW21-BL02	N	BL02	5,800	49,000	15	0.94 J	6.15
SWFTS-MW21	9/21/2017	SWFTS-MW21-EM01	N	EM01	5,200	15,000	3.9	7.5	4.90
SWFTS-MW21	9/27/2017	SWFTS-MW21-EM02	N	EM02	950	4,700	1.8 J	19	0.28
SWFTS-MW21	10/5/2017	SWFTS-MW21-EM03	N	EM03	1,100	7,700	3.2	24	4.40
SWFTS-MW21	10/11/2017	SWFTS-MW21-EM04	N	EM04	820	4,200	1.8	25	0.28
SWFTS-MW21	10/27/2017	SWFTS-MW21-EM05	N	EM05	890	5,000	2.0	2.8	0.45
SWFTS-MW21	11/15/2017	SWFTS-MW21-EM06	N	EM06	2,300	13,000	3.7	2.1	3.07
SWFTS-MW21	12/13/2017	SWFTS-MW21-EM07	N	EM07	3,500	26,000	22	1.6	0.68
SWFTS-MW21	2/20/2018	SWFTS-MW21-EM08	N	EM08	4,800	34,000	11	1.6	0.24
SWFTS-MW21	2/20/2018	SWFTS-MW21-EM08-FD	FD	EM08	4,900	33,000	11	1.6	---
SWFTS-MW21	3/27/2018	SWFTS-MW21-EM09	N	EM09	4,600	32,000	10	1.1	0.37
SWFTS-MW21	4/30/2018	SWFTS-MW21-EM10	N	EM10	4,400	27,000	10	1.3	0.00
SWFTS-MW21	7/12/2018	SWFTS-MW21-EM11	N	EM11	1,300	7,900	2.8	3.7	0.06
SWFTS-MW21	7/27/2018	SWFTS-MW21-EM12	N	EM12	1,000	9,000	---	---	8.98 E
SWFTS-MW21	8/15/2018	SWFTS-MW21-EM13	N	EM13	1,300	2,900	1.9	2.7	0.68
SWFTS-MW21	9/12/2018	SWFTS-MW21-EM14	N	EM14	2,000	2,600	1.3	2.2	0.35
SWFTS-MW21	10/9/2018	SWFTS-MW21-EM15	N	EM15	2,700	2,600	2.9	1.9	0.59
SWFTS-MW21	12/20/2018	SWFTS-MW21-EM16	N	EM16	3,000	5,200	7.5	1.6	1.11
SWFTS-MW22	7/13/2017	SWFTS-MW22-BL02	N	BL02	5,000	7,900	2.2	2.2	2.09

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**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW22	9/20/2017	SWFTS-MW22-EM01	N	EM01	4,000	6,700	1.7	2.2	0.32
SWFTS-MW22	9/27/2017	SWFTS-MW22-EM02	N	EM02	3,800	6,300	1.7	2.6	0.12
SWFTS-MW22	10/5/2017	SWFTS-MW22-EM03	N	EM03	3,500	6,000	1.7	2.7	0.41
SWFTS-MW22	10/12/2017	SWFTS-MW22-EM04	N	EM04	2,600	5,700	1.4	2.3	2.72
SWFTS-MW22	10/26/2017	SWFTS-MW22-EM05	N	EM05	3,700	5,500	1.6	2.6	0.29
SWFTS-MW22	11/16/2017	SWFTS-MW22-EM06	N	EM06	3,000	4,400	1.3	2.5	0.45
SWFTS-MW22	12/14/2017	SWFTS-MW22-EM07	N	EM07	2,500	4,900	1.4	2.6	1.31
SWFTS-MW22	2/21/2018	SWFTS-MW22-EM08	N	EM08	2,000	2,400	0.89 J	2.4	0.43
SWFTS-MW22	3/28/2018	SWFTS-MW22-EM09	N	EM09	2,000	2,600	0.83	2.4	0.65
SWFTS-MW22	4/30/2018	SWFTS-MW22-EM10	N	EM10	1,900	1,800	<0.055	2.2	0.26
SWFTS-MW22	7/10/2018	SWFTS-MW22-EM11	N	EM11	2,900	840	0.81	2.3	2.80
SWFTS-MW22	7/27/2018	SWFTS-MW22-EM12	N	EM12	2,200	3,600	---	---	4.13
SWFTS-MW22	8/16/2018	SWFTS-MW22-EM13	N	EM13	2,400	1,300	0.95 J+	2.4	2.29
SWFTS-MW22	9/11/2018	SWFTS-MW22-EM14	N	EM14	2,800	1,600 J+	1.2	2.2	0.47
SWFTS-MW22	10/9/2018	SWFTS-MW22-EM15	N	EM15	3,100	1,600	1.2	2.7	0.28
SWFTS-MW22	12/27/2018	SWFTS-MW22-EM16	N	EM16	2,400	1,700	1.3	2.4	0.6
SWFTS-MW23	7/13/2017	SWFTS-MW23-BL02	N	BL02	930	20	0.14 J	2.9	0.36
SWFTS-MW23	9/22/2017	SWFTS-MW23-EM01	N	EM01	1,700	160 J	0.64	3.1	0.55
SWFTS-MW23	9/28/2017	SWFTS-MW23-EM02	N	EM02	1,700	120	0.67	3.3	0.16
SWFTS-MW23	10/5/2017	SWFTS-MW23-EM03	N	EM03	1,900	<2,000	0.79	3.2	0.79
SWFTS-MW23	10/11/2017	SWFTS-MW23-EM04	N	EM04	4,000	220	0.88	2.9	1.87
SWFTS-MW23	10/26/2017	SWFTS-MW23-EM05	N	EM05	2,400	270	1.2	2.8	0.38
SWFTS-MW23	11/15/2017	SWFTS-MW23-EM06	N	EM06	2,400	270	1.4	3.0	0.49
SWFTS-MW23	12/12/2017	SWFTS-MW23-EM07	N	EM07	2,800	370	1.5	2.7	0.23
SWFTS-MW23	2/21/2018	SWFTS-MW23-EM08	N	EM08	2,800	300 J-	1.6	3.1	5.42
SWFTS-MW23	3/28/2018	SWFTS-MW23-EM09	N	EM09	2,100	180	0.83	2.8	2.59
SWFTS-MW23	5/2/2018	SWFTS-MW23-EM10	N	EM10	1,400	120	0.43	2.8	0.30
SWFTS-MW23	7/10/2018	SWFTS-MW23-EM11	N	EM11	1,000	18 J	0.11	2.7	0.44
SWFTS-MW23	8/16/2018	SWFTS-MW23-EM13	N	EM13	870	28	0.055 J	3.2	2.48
SWFTS-MW23	9/12/2018	SWFTS-MW23-EM14	N	EM14	1,300	52	0.11	2.7	0.64
SWFTS-MW23	10/11/2018	SWFTS-MW23-EM15	N	EM15	1,500	95 J	<0.28	3.2	1.68
SWFTS-MW23	12/28/2018	SWFTS-MW23-EM16	N	EM16	1,700	110	0.46	2.9	0.97
SWFTS-MW24	7/13/2017	SWFTS-MW24-BL02	N	BL02	13,000	47,000	13	1.3	3.04
SWFTS-MW24	9/22/2017	SWFTS-MW24-EM01	N	EM01	9,400	32,000	9.0	1.7	1.31
SWFTS-MW24	9/28/2017	SWFTS-MW24-EM02	N	EM02	5,200	12,000	4.5	4.3	0.48
SWFTS-MW24	10/5/2017	SWFTS-MW24-EM03	N	EM03	7,800	34,000	9.4	2.0	0.76
SWFTS-MW24	10/11/2017	SWFTS-MW24-EM04	N	EM04	4,400	17,000	4.7	1.9	3.88
SWFTS-MW24	10/26/2017	SWFTS-MW24-EM05	N	EM05	7,000	24,000	7.9	2.0 J-	3.06
SWFTS-MW24	11/15/2017	SWFTS-MW24-EM06	N	EM06	4,100	14,000	3.9	1.9	1.39
SWFTS-MW24	12/12/2017	SWFTS-MW24-EM07	N	EM07	6,600	26,000	6.1	1.5	1.11
SWFTS-MW24	2/21/2018	SWFTS-MW24-EM08	N	EM08	6,100	22,000	6.9	2.0	0.95
SWFTS-MW24	3/28/2018	SWFTS-MW24-EM09	N	EM09	4,800	15,000	5.4	1.6	0.55
SWFTS-MW24	5/2/2018	SWFTS-MW24-EM10	N	EM10	4,800	12,000	6.6	1.5	0.00
SWFTS-MW24	7/12/2018	SWFTS-MW24-EM11	N	EM11	5,000	6,100	7.3	1.3	0.10
SWFTS-MW24	7/27/2018	SWFTS-MW24-EM12	N	EM12	4,000	7,100	---	---	5.09
SWFTS-MW24	8/15/2018	SWFTS-MW24-EM13	N	EM13	4,000	4,800	7.6	1.9	1.83
SWFTS-MW24	9/12/2018	SWFTS-MW24-EM14	N	EM14	3,700	3,500	6.1	1.6	0.75

**Table 2**  
**Groundwater Analytical Results**  
 Seep Well Field Area Bioremediation Treatability Study

Well	Sample Date	Sample ID	QC Type	Event	Perchlorate by USEPA Method 314.0	Chlorate by USEPA Method 300.1B	Nitrate (as N) by USEPA Method 300.0	Total Organic Carbon by SM 5310B	Field Measurement Dissolved Oxygen
					ug/L	ug/L	mg/L	mg/L	mg/L
SWFTS-MW24	10/10/2018	SWFTS-MW24-EM15	N	EM15	3,500	2,700	6.5	2.0	2.95
SWFTS-MW24	1/2/2019	SWFTS-MW24-EM16	N	EM16	3,500	2,000	7.7	1.7	1.55
SWFTS-MW25	7/13/2017	SWFTS-MW25-BL02	N	BL02	17,000	43,000	10	1.8	3.03
SWFTS-MW25	9/22/2017	SWFTS-MW25-EM01	N	EM01	280	<200	<0.55	13	0.50
SWFTS-MW25	9/28/2017	SWFTS-MW25-EM02	N	EM02	370	130	<0.55	4.8	0.14
SWFTS-MW25	10/5/2017	SWFTS-MW25-EM03	N	EM03	230	<500	<0.55	3.3	0.96
SWFTS-MW25	10/11/2017	SWFTS-MW25-EM04	N	EM04	140	160	<0.55	2.7	0.26
SWFTS-MW25	10/26/2017	SWFTS-MW25-EM05	N	EM05	420	170	<0.28	2.6	0.98
SWFTS-MW25	11/15/2017	SWFTS-MW25-EM06	N	EM06	440	630	<0.55	2.5	1.11
SWFTS-MW25	12/12/2017	SWFTS-MW25-EM07	N	EM07	2,300	1,700	<0.55	2.3	0.63
SWFTS-MW25	2/21/2018	SWFTS-MW25-EM08	N	EM08	2,800	4,700	<1.1	2.4	0.32
SWFTS-MW25	3/28/2018	SWFTS-MW25-EM09	N	EM09	4,600	11,000	2.8	2.0	0.20
SWFTS-MW25	5/3/2018	SWFTS-MW25-EM10	N	EM10	5,700	3,600	4.2	1.9	0.00
SWFTS-MW25	7/10/2018	SWFTS-MW25-EM11	N	EM11	4,300	2,100	3.6	1.7	3.00
SWFTS-MW25	7/27/2018	SWFTS-MW25-EM12	N	EM12	3,500	2,300	---	---	2.49
SWFTS-MW25	8/15/2018	SWFTS-MW25-EM13	N	EM13	4,500	4,300	5.2	2.3	1.91
SWFTS-MW25	9/12/2018	SWFTS-MW25-EM14	N	EM14	5,200	6,800	6.9	1.9	0.47
SWFTS-MW25	10/11/2018	SWFTS-MW25-EM15	N	EM15	5,000	7,600	7.9	2.0	1.25
SWFTS-MW25	1/2/2019	SWFTS-MW25-EM16	N	EM16	6,300	11,000	8.7	2.0	0.97

Notes:

mg/L - milligrams per liter

ug/L - micrograms per liter

-- not analyzed

< The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

E Instrument error during sampling

**Table 3**  
**Injection Wells**  
 Seep Well Field Bioremediation Treatability Study

Monitoring Well/Borehole ID	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water <sup>1</sup>	Well Diameter	Borehole Diameter	Borehole Total Depth	Well Total Depth	Bottom of Screen	Top of Screen	Screen Length	Slot Size
			feet amsl	feet amsl	feet bTOC	inches	inches	feet bgs	feet bgs	feet bgs	feet bgs	feet	inches
<b>Newly Installed Injection Wells (May-June 2017)</b>													
SWFTS-IW01A	26733059.73	831579.19	1553.61	1553.32	13.00	2	8	27	26.0	25.6	15.8	10	0.020
SWFTS-IW01B	26733061.20	831585.84	1553.49	1553.07	13.06	2	8	41	37.1	36.7	26.9	10	0.020
SWFTS-IW02A	26733009.17	831645.08	1554.49	1554.08	14.23	2	8	29	27.0	26.6	16.8	10	0.020
SWFTS-IW02B	26733010.07	831650.33	1554.42	1554.13	14.27	2	8	39	36.5	36.1	26.3	10	0.020
SWFTS-IW03	26732964.70	831711.03	1554.71	1554.46	14.80	2	8	39	37.0	36.6	16.8	20	0.020
SWFTS-IW04	26732932.97	831756.77	1554.45	1554.04	14.46	2	8	37	35.0	34.6	19.8	15	0.020
SWFTS-IW05	26732883.80	831829.89	1552.17	1551.91	12.68	2	8	37	34.8	34.4	14.6	20	0.020
SWFTS-IW06A	26732833.83	831891.31	1553.09	1552.79	14.15	2	8	29	27.0	26.6	16.8	10	0.020
SWFTS-IW06B	26732834.30	831898.57	1552.81	1552.47	13.85	2	8	37	34.0	33.6	28.8	5	0.020
SWFTS-IW07	26732787.99	831961.16	1554.76	1554.48	16.00	2	8	39	37.5	37.1	17.3	20	0.020
SWFTS-IW08	26732749.42	832014.32	1557.84	1557.47	19.60	2	8	41	37.7	37.3	17.5	20	0.020
SWFTS-IW09	26732702.88	832078.62	1562.81	1562.59	24.38	2	8	49	46.8	46.4	26.6	20	0.020
SWFTS-IW10	26732656.78	832141.67	1562.43	1561.95	23.84	2	8	49	47.0	46.6	26.8	20	0.020
SWFTS-IW11	26733124.81	831685.02	1552.61	1552.31	12.45	2	8	41	37.5	37.1	17.3	20	0.020
SWFTS-IW12	26733067.66	831734.08	1552.94	1552.70	13.10	2	8	43	39.5	39.1	14.3	25	0.020
SWFTS-IW13A	26733022.97	831802.64	1552.73	1552.38	13.03	2	8	28	26.0	25.6	15.8	10	0.020
SWFTS-IW13B	26733022.94	831812.84	1552.42	1552.12	12.75	2	8	40	38.0	37.6	27.8	10	0.020
SWFTS-IW14	26732981.31	831875.23	1551.69	1551.36	12.65	2	8	39	36.5	36.1	16.2	20	0.020
SWFTS-IW15	26732942.89	831928.63	1551.17	1550.76	12.66	2	8	39	36.6	36.2	16.4	20	0.020
SWFTS-IW16A	26732896.44	831977.77	1553.06	1552.72	14.77	2	8	29	27.5	27.1	17.3	10	0.020
SWFTS-IW16B	26732895.94	831984.74	1552.88	1552.43	14.50	2	8	39	36.7	36.3	26.5	10	0.020
SWFTS-IW17	26732849.16	832045.01	1554.57	1554.01	16.22	2	8	39	37.5	37.1	17.3	20	0.020
SWFTS-IW18	26732811.24	832095.47	1555.71	1555.47	17.84	2	8	39	38.5	38.1	18.1	20	0.020
SWFTS-IW19	26732753.36	832168.69	1560.08	1560.06	22.55	2	8	47	44.5	44.1	24.3	20	0.020
SWFTS-IW20	26732716.42	832222.65	1563.11	1562.85	25.30	2	8	53	51.0	50.6	30.8	20	0.020

Notes:

amsl - above mean sea level

bTOC - below top of casing

bgs - below ground surface

1. Depth to water measurements collected during baseline groundwater sampling event on July 10, 2017.

**Table 4**  
**Summary of Injection Activities - January/February 2019**  
 Seep Well Field Area Bioremediation Treatability Study

Injection Date and Time <sup>1</sup>	Injection Well ID	Average Flow Rate (gpm)	Sustained Pressure (psi)	Injectate Solution					Volume of Distribution Water Injected (gal)
				Volume of EOS (gal)	Volume of Aquapure 3601 NSF (gal)	Volume of Glycerin (lbs)	Mass of Sodium Sulfite (lbs)	Volume of Water Injected as Part of Injectate Solution (gal)	
01/23/2019 10:25 - 16:45	SWFTS-IW01A	11.2	35	344	3	79	6	1374	-
	SWFTS-IW01B	9.9	35	400	4	92	7	1600	-
	SWFTS-IW02A	9.4	35	190	2	44	3	762	-
	SWFTS-IW02B	8.2	25	400	4	92	7	1600	-
	SWFTS-IW03	11.5	25	800	7	185	14	3200	-
	SWFTS-IW04	8.6	25	600	5	139	11	2400	-
	SWFTS-IW06B	2.3	35	160	1	37	3	642	-
	SWFTS-IW07	8.6	20	657	6	152	12	2626	-
	SWFTS-IW08	7.9	15	597	5	138	11	2390	-
	SWFTS-IW09	2.9	35	218	2	50	4	871	-
	SWFTS-IW16A	9.5	20	82	1	19	1	328	-
	SWFTS-IW16B	6.2	20	400	4	92	7	1600	-
	SWFTS-IW17	5.9	35	448	4	104	8	1794	-
	SWFTS-IW18	3.6	35	271	2	63	5	1083	-
SWFTS-IW20	5.9	30	231	2	53	4	923	-	
SWFTS-IW20	7.2	30	255	2	59	5	1019	-	
Daily Summary				6053	54	1398	108	24212	0
01/24/2019 8:58 - 16:48	SWFTS-IW01A	6.1	35	56	1	13	1	226	-
	SWFTS-IW02A	13.3	35	210	2	48	4	838	-
	SWFTS-IW05	12.7	10	394	4	91	7	1578	-
	SWFTS-IW05	12.4	10	366	3	84	7	1463	-
	SWFTS-IW06B	2.5	35	76	1	18	1	304	-
	SWFTS-IW06B	1.6	35	48	0	11	1	192	-
	SWFTS-IW07	9.2	25	263	2	61	5	1054	-
	SWFTS-IW08	9.1	25	283	3	65	5	1134	-
	SWFTS-IW08	7.4	25	19	0	4	0	77	-
	SWFTS-IW09	3.1	35	96	1	22	2	385	-
	SWFTS-IW09	2.6	35	76	1	18	1	306	-
	SWFTS-IW10	2.5	25	77	1	18	1	310	-
	SWFTS-IW10	2.8	25	83	1	19	1	334	-
	SWFTS-IW11	8.0	25	160	1	37	3	639	-
	SWFTS-IW11	7.8	30	231	2	53	4	926	-
	SWFTS-IW12	8.4	30	260	2	60	5	1041	-
	SWFTS-IW12	6.7	30	200	2	46	4	798	-
	SWFTS-IW13A	9.0	25	279	3	64	5	1117	-
	SWFTS-IW13A	8.2	25	244	2	56	4	974	-
	SWFTS-IW14	20.2	25	599	5	138	11	2397	-
	SWFTS-IW15	7.5	30	222	2	51	4	888	-
SWFTS-IW16A	6.3	20	195	2	45	3	778	-	
SWFTS-IW16A	13.7	35	123	1	29	2	494	-	
SWFTS-IW17	6.5	35	202	2	47	4	806	-	
SWFTS-IW17	4.1	35	123	1	28	2	490	-	
SWFTS-IW18	2.4	35	75	1	17	1	299	-	
SWFTS-IW18	1.8	35	52	0	12	1	209	-	
SWFTS-IW20	7.2	35	222	2	51	4	890	-	
SWFTS-IW20	10.9	35	192	2	44	3	768	-	
Daily Summary				5426	50	1250	96	21715	0
01/25/2019 7:46 - 16:30	SWFTS-IW05	10.0	15	40	0	9	1	159	-
	SWFTS-IW06A	6.2	35	58	1	13	1	233	-
	SWFTS-IW06A	9.1	30	360	3	83	6	1441	-
	SWFTS-IW06B	0.8	35	10	0	2	0	40	-
	SWFTS-IW06B	1.2	35	46	0	11	1	186	-
	SWFTS-IW09	2.8	35	30	0	7	1	118	-
	SWFTS-IW09	2.4	35	97	1	22	2	387	-
	SWFTS-IW10	1.1	35	8	0	2	0	33	-
	SWFTS-IW11	6.0	30	83	1	19	1	332	-
	SWFTS-IW11	7.5	30	299	3	69	5	1195	-
	SWFTS-IW12	5.6	30	77	1	18	1	310	-
	SWFTS-IW12	7.6	35	302	3	70	5	1207	-
	SWFTS-IW13A	6.5	30	92	1	21	2	370	-
	SWFTS-IW13A	9.8	35	389	3	90	7	1557	-
	SWFTS-IW14	14.1	30	201	2	46	4	803	-
	SWFTS-IW15	3.7	35	53	0	12	1	213	-
	SWFTS-IW15	8.6	35	342	3	79	6	1370	-
	SWFTS-IW17	2.1	35	30	0	7	1	122	-
SWFTS-IW17	5.1	35	97	1	22	2	388	-	
SWFTS-IW18	2.2	35	32	0	7	1	128	-	
SWFTS-IW18	2.2	35	87	1	20	2	349	-	
Daily Summary				2733	24	629	50	10941	0

**Table 4**  
**Summary of Injection Activities - January/February 2019**  
 Seep Well Field Area Bioremediation Treatability Study

Injection Date and Time <sup>1</sup>	Injection Well ID	Average Flow Rate (gpm)	Sustained Pressure (psi)	Injectate Solution					Volume of Distribution Water Injected (gal)
				Volume of EOS (gal)	Volume of Aquapure 3601 NSF (gal)	Volume of Glycerin (lbs)	Mass of Sodium Sulfite (lbs)	Volume of Water Injected as Part of Injectate Solution (gal)	
01/26/2019 7:43 - 16:45	SWFTS-IW06A	7.1	30	136	1	31	2	542	-
	SWFTS-IW07	10.2	30	200	2	46	4	800	-
	SWFTS-IW08	10.6	25	200	2	46	4	800	-
	SWFTS-IW09	2.4	35	177	2	41	3	708	-
	SWFTS-IW09	2.5	35	52	0	12	1	206	-
	SWFTS-IW11	7.9	30	27	0	6	0	108	-
	SWFTS-IW12	6.7	35	161	1	37	3	644	-
	SWFTS-IW13A	6.4	35	196	2	45	4	782	-
	SWFTS-IW15	5.2	35	382	3	88	7	1530	-
	SWFTS-IW18	3.2	35	237	2	55	4	949	-
	SWFTS-IW18	1.9	35	40	0	9	1	159	-
	SWFTS-IW20	7.6	35	130	1	30	2	520	-
	<b>Daily Summary</b>			1938	16	446	35	7748	0
01/27/2019 7:22 - 16:35	SWFTS-IW08	7.4	25	84	1	19	2	336	-
	SWFTS-IW09	2.2	25	244	2	56	4	975	-
	SWFTS-IW17	2.6	35	5	0	1	0	21	-
	SWFTS-IW18	2.4	35	266	2	61	5	1063	-
	<b>Daily Summary</b>			599	5	137	11	2395	0
01/28/2019 7:50 - 16:28	SWFTS-IW01B	8.0	10	-	-	-	-	-	4,139
	SWFTS-IW02B	2.4	10	-	-	-	-	-	1,229
	SWFTS-IW03	5.6	20	-	-	-	-	-	2,910
	SWFTS-IW04	3.6	10	-	-	-	-	-	1,851
	SWFTS-IW06A	5.5	15	-	-	-	-	-	2,584
	SWFTS-IW07	5.5	15	-	-	-	-	-	2,828
	SWFTS-IW08	7.0	15	-	-	-	-	-	3,634
	SWFTS-IW09	2.2	20	-	-	-	-	-	1,152
	SWFTS-IW13A	5.5	20	-	-	-	-	-	2,849
	SWFTS-IW16B	6.9	15	-	-	-	-	-	3,591
	SWFTS-IW17	8.6	15	-	-	-	-	-	4,432
	SWFTS-IW18	2.9	20	-	-	-	-	-	1,510
	SWFTS-IW20	5.3	20	-	-	-	-	-	2,735
	<b>Daily Summary</b>			0	0	0	0	0	35,444
01/29/2019 7:46 - 13:06	SWFTS-IW01B	9.2	10	-	-	-	-	-	2941
	SWFTS-IW02B	2.5	10	-	-	-	-	-	791
	SWFTS-IW03	4.9	15	-	-	-	-	-	1572
	SWFTS-IW04	4.3	10	-	-	-	-	-	1373
	SWFTS-IW06A	6	15	-	-	-	-	-	1920
	SWFTS-IW07	7.1	5	-	-	-	-	-	2282
	SWFTS-IW08	9.1	10	-	-	-	-	-	2918
	SWFTS-IW09	2.4	15	-	-	-	-	-	778
	SWFTS-IW13A	6.7	15	-	-	-	-	-	2128
	SWFTS-IW16B	5.5	15	-	-	-	-	-	1768
	SWFTS-IW17	10.4	15	-	-	-	-	-	3314
	SWFTS-IW18	6.8	20	-	-	-	-	-	2175
	SWFTS-IW20	6.4	15	-	-	-	-	-	2059
	<b>Daily Summary</b>			0	0	0	0	0	26,019
01/30/2019 7:33 - 14:37	SWFTS-IW01A	8.7	10	-	-	-	-	-	1,847
	SWFTS-IW01B	8.2	10	-	-	-	-	-	1,670
	SWFTS-IW02B	2.6	10	-	-	-	-	-	1,103
	SWFTS-IW03	7.3	15	-	-	-	-	-	3,115
	SWFTS-IW04	4.2	10	-	-	-	-	-	1,767
	SWFTS-IW06A	2.5	15	-	-	-	-	-	1,025
	SWFTS-IW07	7.7	10	-	-	-	-	-	3,270
	SWFTS-IW08	9.6	5	-	-	-	-	-	4,084
	SWFTS-IW09	3.4	10	-	-	-	-	-	1,436
	SWFTS-IW13A	6.0	15	-	-	-	-	-	2,546
	SWFTS-IW16B	5.9	15	-	-	-	-	-	2,499
	SWFTS-IW17	11.6	15	-	-	-	-	-	4,924
	SWFTS-IW18	8.4	20	-	-	-	-	-	2,252
	SWFTS-IW18	3.8	25	-	-	-	-	-	579
	SWFTS-IW20	7.4	15	-	-	-	-	-	3,145
	<b>Daily Summary</b>			0	0	0	0	0	35,262

**Table 4**  
**Summary of Injection Activities - January/February 2019**  
 Seep Well Field Area Bioremediation Treatability Study

Injection Date and Time <sup>1</sup>	Injection Well ID	Average Flow Rate (gpm)	Sustained Pressure (psi)	Injectate Solution					Volume of Distribution Water Injected (gal)
				Volume of EOS (gal)	Volume of Aquapure 3601 NSF (gal)	Volume of Glycerin (lbs)	Mass of Sodium Sulfite (lbs)	Volume of Water Injected as Part of Injectate Solution (gal)	
02/04/2019 9:10 - 16:20	SWFTS-IW01A	7.5	15	-	-	-	-	-	2,302
	SWFTS-IW02B	2.7	15	-	-	-	-	-	810
	SWFTS-IW03	5.9	20	-	-	-	-	-	1,787
	SWFTS-IW04	4.4	10	-	-	-	-	-	1,346
	SWFTS-IW06A	2.6	20	-	-	-	-	-	788
	SWFTS-IW07	9.1	10	-	-	-	-	-	2,781
	SWFTS-IW08	7.7	15	-	-	-	-	-	2,361
	SWFTS-IW09	4.0	15	-	-	-	-	-	1,223
	SWFTS-IW10	3.5	20	-	-	-	-	-	1,062
	SWFTS-IW13A	5.3	20	-	-	-	-	-	477
	SWFTS-IW14	8.6	15	-	-	-	-	-	1,742
	SWFTS-IW16B	4.8	20	-	-	-	-	-	1,386
	SWFTS-IW17	9.0	20	-	-	-	-	-	2,749
SWFTS-IW18	3.6	20	-	-	-	-	-	1,109	
SWFTS-IW20	5.6	15	-	-	-	-	-	2,389	
Daily Summary				0	0	0	0	0	24,312
02/05/2019 10:30 - 16:25	SWFTS-IW01A	12.2	10	-	-	-	-	-	4,347
	SWFTS-IW02B	2.4	15	-	-	-	-	-	846
	SWFTS-IW03	8.7	15	-	-	-	-	-	3,083
	SWFTS-IW04	4.1	10	-	-	-	-	-	1,441
	SWFTS-IW06A	2.2	20	-	-	-	-	-	793
	SWFTS-IW07	11.9	5	-	-	-	-	-	4,236
	SWFTS-IW08	8.7	10	-	-	-	-	-	2,583
	SWFTS-IW09	5.3	20	-	-	-	-	-	1,880
	SWFTS-IW10	4.5	20	-	-	-	-	-	1,615
	SWFTS-IW14	11.0	15	-	-	-	-	-	3,909
	SWFTS-IW15	2.6	35	-	-	-	-	-	912
	SWFTS-IW16A	8.9	35	-	-	-	-	-	3,167
	SWFTS-IW17	9.6	20	-	-	-	-	-	1,555
SWFTS-IW18	3.7	25	-	-	-	-	-	1,315	
SWFTS-IW20	8.2	25	-	-	-	-	-	2,916	
Daily Summary				0	0	0	0	0	34,598
02/06/2019 10:06 - 16:02	SWFTS-IW01A	11.5	10	-	-	-	-	-	254
	SWFTS-IW02B	2.3	15	-	-	-	-	-	762
	SWFTS-IW03	8.9	20	-	-	-	-	-	2,973
	SWFTS-IW04	3.7	15	-	-	-	-	-	1,239
	SWFTS-IW06A	2.1	30	-	-	-	-	-	700
	SWFTS-IW07	16.8	5	-	-	-	-	-	503
	SWFTS-IW09	7.8	35	-	-	-	-	-	2,601
	SWFTS-IW10	5.4	30	-	-	-	-	-	1,800
	SWFTS-IW12	11.9	15	-	-	-	-	-	3,487
	SWFTS-IW14	10.2	20	-	-	-	-	-	3,402
	SWFTS-IW15	11.3	30	-	-	-	-	-	3,752
	SWFTS-IW16A	11.9	35	-	-	-	-	-	3,961
	SWFTS-IW18	4.5	30	-	-	-	-	-	1,508
SWFTS-IW20	8.7	25	-	-	-	-	-	3,106	
Daily Summary				0	0	0	0	0	30,048
02/07/2019 9:35 - 15:39	SWFTS-IW02A	17.2	25	-	-	-	-	-	6,260
	SWFTS-IW03	11.5	10	-	-	-	-	-	2,069
	SWFTS-IW04	6.8	25	-	-	-	-	-	2,475
	SWFTS-IW05	34.8	20	-	-	-	-	-	8,711
	SWFTS-IW06A	1.8	35	-	-	-	-	-	170
	SWFTS-IW06B	5.0	30	-	-	-	-	-	1,252
	SWFTS-IW09	7.3	35	-	-	-	-	-	2,645
	SWFTS-IW11	14.8	30	-	-	-	-	-	4,010
	SWFTS-IW12	12.0	20	-	-	-	-	-	4,373
	SWFTS-IW14	11.1	20	-	-	-	-	-	4,045
	SWFTS-IW15	12.4	35	-	-	-	-	-	4,509
	SWFTS-IW16A	15.6	35	-	-	-	-	-	1,684
	SWFTS-IW18	5.4	35	-	-	-	-	-	1,983
Daily Summary				0	0	0	0	0	44,186

**Table 4**  
**Summary of Injection Activities - January/February 2019**  
 Seep Well Field Area Bioremediation Treatability Study

Injection Date and Time <sup>1</sup>	Injection Well ID	Average Flow Rate (gpm)	Sustained Pressure (psi)	Injectate Solution					Volume of Distribution Water Injected (gal)
				Volume of EOS (gal)	Volume of Aquapure 3601 NSF (gal)	Volume of Glycerin (lbs)	Mass of Sodium Sulfite (lbs)	Volume of Water Injected as Part of Injectate Solution (gal)	
02/08/2019 9:55 - 16:40	SWFTS-IW02A	17.3	35	-	-	-	-	-	7,000
	SWFTS-IW04	6.0	10	-	-	-	-	-	1,633
	SWFTS-IW05	17.7	5	-	-	-	-	-	7,152
	SWFTS-IW06B	4.7	20	-	-	-	-	-	1,911
	SWFTS-IW09	6.4	20	-	-	-	-	-	1,884
	SWFTS-IW11	14.8	35	-	-	-	-	-	6,000
	SWFTS-IW12	11.6	5	-	-	-	-	-	4,698
	SWFTS-IW14	10.0	10	-	-	-	-	-	4,061
	SWFTS-IW15	9.8	10	-	-	-	-	-	3,967
SWFTS-IW18	4.4	20	-	-	-	-	-	1,802	
<b>Daily Summary</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40,108</b>
02/09/2019 9:55 - 16:40	SWFTS-IW02A	17.3	30	-	-	-	-	-	9,600
	SWFTS-IW05	19.3	5	-	-	-	-	-	1,637
	SWFTS-IW06B	4.7	20	-	-	-	-	-	508
	SWFTS-IW11	14.8	35	-	-	-	-	-	8,200
	SWFTS-IW12	29.0	15	-	-	-	-	-	9,318
	SWFTS-IW14	14.8	10	-	-	-	-	-	341
	SWFTS-IW15	13.4	20	-	-	-	-	-	3,361
	SWFTS-IW18	7.6	35	-	-	-	-	-	1,968
<b>Daily Summary</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>34,933</b>
02/10/2019 6:19 - 12:42	SWFTS-IW01B	4.3	30	-	-	-	-	-	1,665
	SWFTS-IW02A	11.6	35	-	-	-	-	-	4,448
	SWFTS-IW11	10.0	35	-	-	-	-	-	3,842
<b>Daily Summary</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,955</b>
<b>Injection Event Summary</b>				<b>16749</b>	<b>149</b>	<b>3860</b>	<b>300</b>	<b>67011</b>	<b>314,865</b>

Notes:

- gpm      gallons per minute
- psi      pounds per square inch
- EOS      emulsified vegetable oil substrate
- gal      gallons
- lbs      pounds
- %wt      percent by weight
- g/L      grams per liter
- <sup>1</sup>      Not all injection wells indicated were operated during the entire time interval specified.
- <sup>2</sup>      Aquapure 3601 NSF is a mixture of phosphates, sodium hydroxide, and other trace amendments used as nutrients for biological activities. □