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TECHNICAL MEMORANDUM
CARBON DIOXIDE SPARGE WELL NETWORK DECOMMISSIONING REPORT
LCP CHEMICALS SUPERFUND SITE – BRUNSWICK, GEORGIA

Date: September 1, 2021

To: Mr. Robert H. Pope, Senior Remedial Project Manager (U.S. EPA Region IV, Superfund and Emergency Management Division)

From: Kirk Kessler, P.G., Montrose Environmental Solutions

Cc: Prashant Gupta, Honeywell

Background

Honeywell entered into an Administrative Settlement Agreement and Order on Consent for Removal Action ("AOC") in 2007, with the United States Environmental Protection Agency ("EPA") to address a condition known as the Caustic Brine Pool ("CBP") at the LCP Chemicals Superfund Site located in Brunswick, Georgia (the "Site"). The term CBP was devised to bound an altered groundwater geochemical condition resulting from a comingled release of chlor-alkali process liquids (caustic and brine) from the cell building area ("CBA").[1]

In April 2021, on behalf of Honeywell, Environmental Planning Specialists, Inc. (dba: Montrose Environmental Solutions ("Montrose")) submitted a technical memorandum (EPS, 2021) that: 1) summarized the phases of sparging and response of the Site groundwater pH condition to the CO_2 treatment, and 2) proposed decommissioning of the well network associated with the CBP treatments (*i.e.*, the sparge wells and performance monitoring piezometers) and remnant piezometers related to activity prior to the CBP treatment existing in the same vicinity. EPA issued approval of the well decommissioning in email communication dated May 6, 2021. The CBP well network and piezometers were decommissioned in July 2021, as described herein.

[1] The CBA is the area of former chlor-alkali manufacturing operation located south of B-Street. Two sister buildings at this location designated Cell Building 1 (north building) and Cell Building 2 (south building) each contained an independent mercury cell process supported by a salt purification plant and additional on-Site holding tanks for process liquids.

Summary of Work Performed

From July 12-27, 2021, a total of 317 wells were decommissioned in place and sealed in accordance with EPA Region 4 guidance, *Design and Installation of Monitoring Wells (SESDGUID-101-R2)* (EPA, 2018): 263 sparge wells[2], 35 piezometers, and 7 proof-of-concept monitoring wells associated with the CBP treatments, and 12 piezometers associated with the historical phytoremediation pilot study for OU2. Locations of decommissioned wells are illustrated on Figure 2, and well construction details are provided in Table 1. A photographic log of decommissioning activities is included as Attachment 1.

Prior to decommissioning, depth to water and total depth measurements were collected at each well or piezometer (herein collectively referred to as 'wells'), to verify the construction detail records and estimate the volume of grout required to plug each well. Estimated requisite grout volume was calculated using the following formula:

$$C_{vol} = (W_c * W_{total}) + (L_{fp} * B_c * n_{fp})$$

where:

- C_{vol} = grout volume required to back-plug the well including the filter pack;
- W_c = well capacity in gallons per foot (gal/ft) [0.16 gal/ft for a 2-in PVC casing; 0.04 gal/ft for a 1-in PVC casing];
- W_{total} = well length total includes casing and screen;
- n_{fp} = porosity of the filter pack (0.2);
- L_{fp} = length of the well filter pack (assumed to be 2 feet longer than the screen); and
- B_c = borehole capacity gal/ft [1.02 gal/ft for a 5-inch borehole].

Wells were plugged using a neat cement grout with 5% (by weight) bentonite (*i.e.*, 5 pounds of bentonite to 94 pounds of Portland cement to 5 gallons of water) per Georgia Environmental Protection Division specifications (EPD, 1988). The grout mixture was placed in each well from the bottom upwards to the top-of-casing ("TOC") using the positive displacement method (*i.e.*, the tremie method), and grout was allowed 24 hours to set in each well. Additional grout was placed in wells where more than 1 foot of settlement was observed. Equipment for mixing and placing the grout mixture included a flatbed trailer with a 275-gallon water tote, air compressor, 55-gallon mixing drum, and 1-inch diaphragm pump with associated piping.

[2] Three of the 500-series CBP extraction performance monitoring well clusters (MW-510 A/B, MW-511 A/B and MW-518 A/B) were inadvertently plugged during the decommissioning event. Two sparge wells (SW-77 and SW-197) were converted to monitoring wells at the request of EPA, to replace the abandoned monitoring wells. The sparge wells were converted to monitoring wells by removing the steel well heads and extending the well riser to 3-feet above grade.

Concrete well pads were removed using a skid steer, and the PVC well casing cut below grade.[3] Well pads and steel well heads were placed in roll-off containers for off-site disposal. The well pad footprint was restored with topsoil and compacted flush to grade.

References

[EPA] United States Environmental Protection Agency (2018). "Design and Installation of Monitoring Wells". Science and Ecosystem Support Division, SESDGUID-101-R2. January.

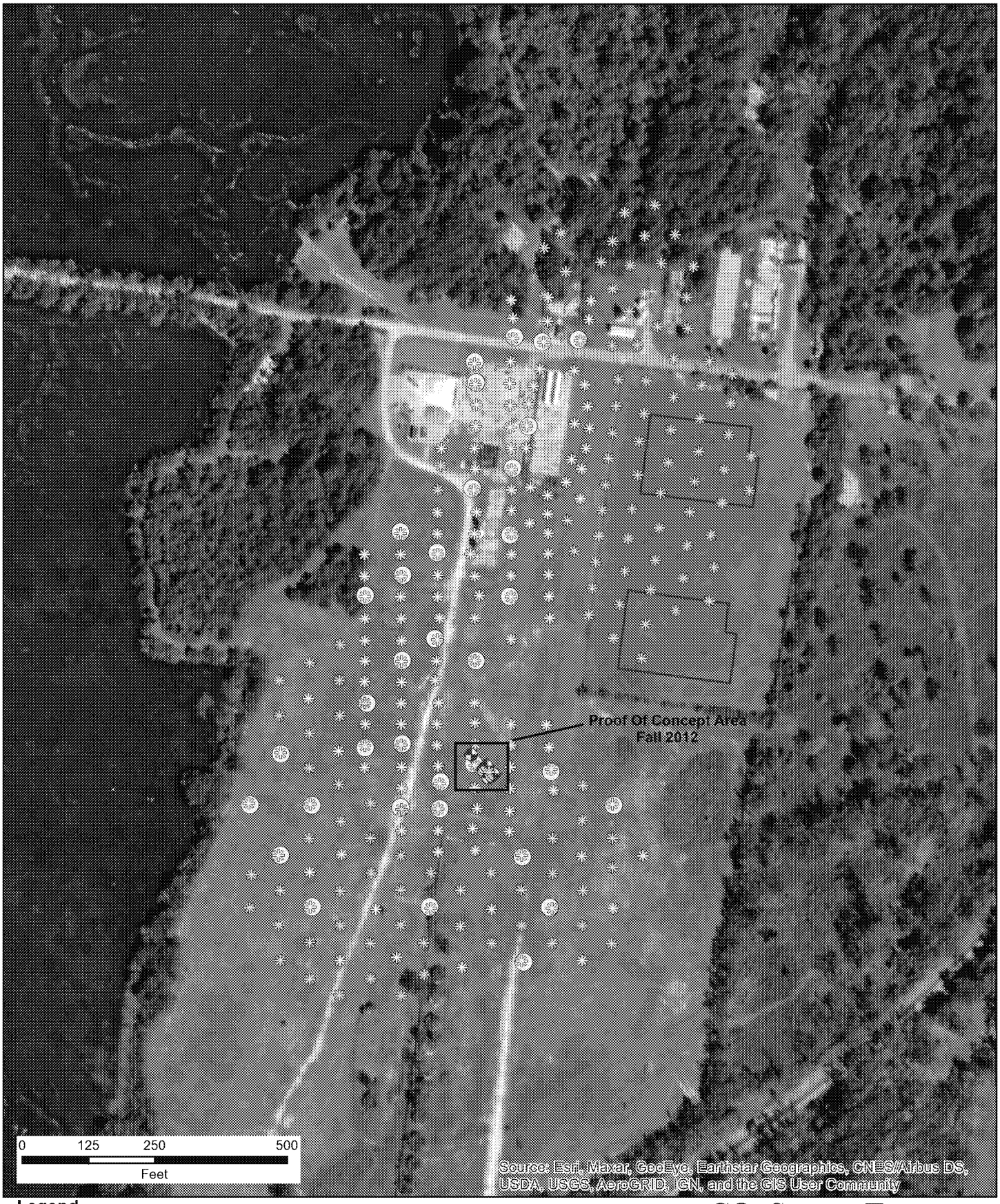
[GDNR] Georgia Department of Natural Resources (1988). "Grouting and Plugging of Domestic Water Wells in Georgia."

[EPS] Environmental Planning Specialists, Inc (2021). "Technical Memorandum, Revision 1 Decommissioning of Carbon Dioxide Sparge Well Network, LCP Chemicals Superfund Site – Brunswick, Georgia." April 14.

[Mutch] Mutch and Associates (2020). "CO_2 Sparging Phase 4 Full-Scale Implementation and Monitoring Report. LCP Chemicals Site, Brunswick, Georgia." Revision 1, June.

[3] A few shallow piezometers associated with the CBP treatments were incidentally pulled (*i.e.*, casings were fully removed) during removal of the well pad. The open borehole was filled with grout from the point of downhole collapse to ground surface.

FIGURES



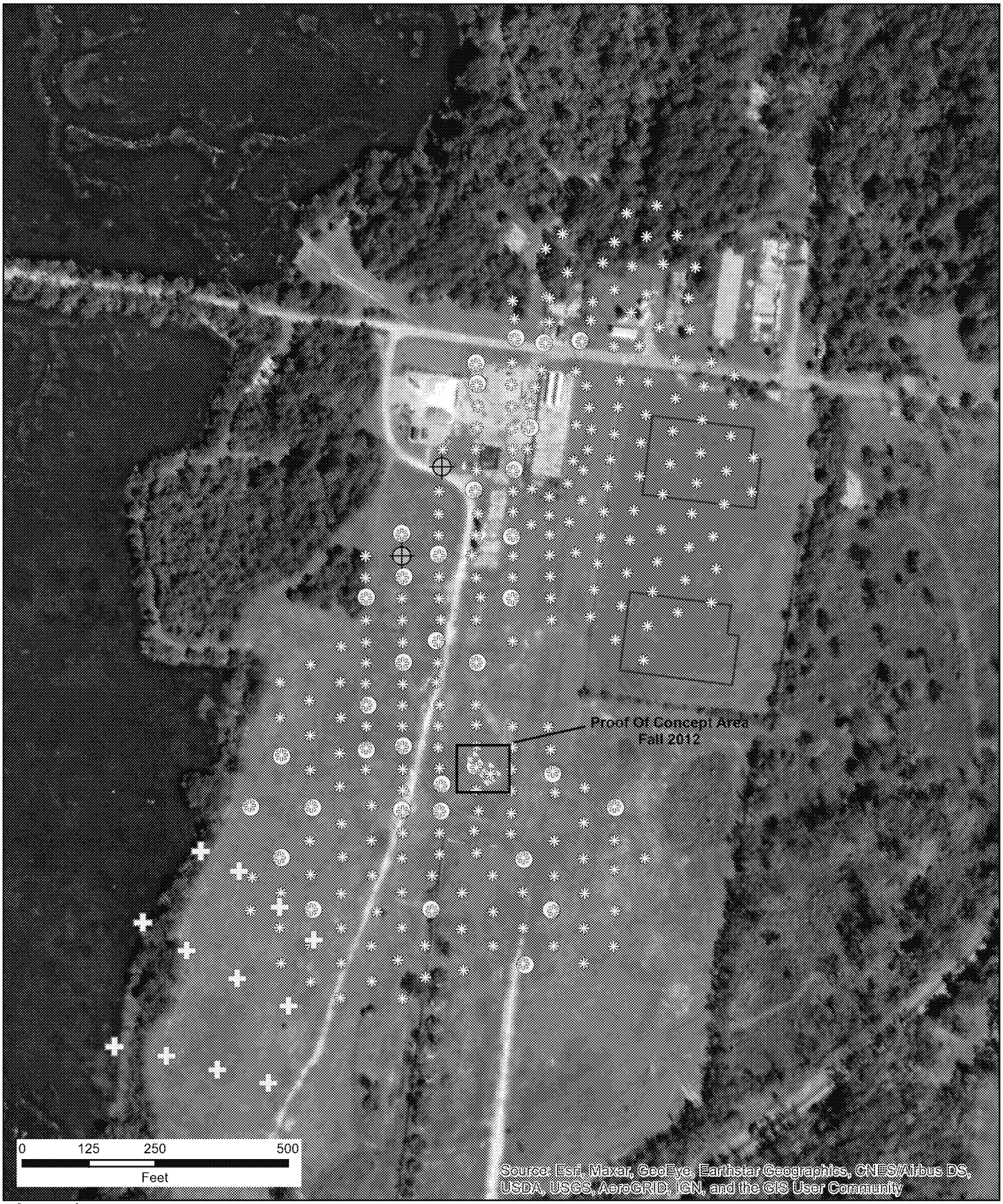
Legend

- Cell Buildings
- CBP Neutralization Proof of Concept Monitoring Well
- CBP Neutralization Piezometer
- PoC Installation
- Phase I Installations
- Phase II Installations
- Phase III Installations
- Phase IV Installations

CO_2 Sparge Treatment Well Network

MONTROSE

Figure No. 1



Legend

- Cell Buildings
- Phytoremediation Piezometer
- Sparge Wells Converted to MWs
- Sparge Wells
- CBP Neutralization Proof of Concept Monitoring Well
- CBP Neutralization Piezometer

Decomissioned Well Locations

MONTROSE

Figure No. 2

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TABLES

Table 1. Well Construction Details

Well	X (ft)	Y (ft)	Depth to Top of Screen (ft bgs)	Total Depth (ft bgs)	Diameter (in)	Date of Decommissioning	Depth To Water* (ft bgs)	Total Depth* (ft bgs)
CO_2 Sparge Wells (Proof of Concept, Phases 1-4)								
SW-1	861709.65	431508.23	40	45	4	7/15/2021	3.34	45.3
SW-2	861479.17	431594.89	47.5	49.5	2	7/14/2021	4.78	50.0
SW-3	861477.79	431675.46	46	48	2	7/14/2021	3.20	47.9
SW-4	861478.76	431752.69	48.42	50.42	2	7/14/2021	3.48	48.7
SW-5	861478.13	431835.72	48.5	50.5	2	7/26/2021	3.62	51.0
SW-6	861477.25	431915.23	49	51	2	7/14/2021	3.33	51.6
SW-7	861547.34	431394.30	48	50	2	7/13/2021	3.72	50.0
SW-8	861547.59	431473.97	48	50	2	7/14/2021	4.45	48.5
SW-9	861546.71	431555.73	47.5	49.5	2	7/14/2021	3.95	48.7
SW-10	861547.06	431634.58	47.5	49.5	2	7/14/2021	3.95	49.5
SW-11	861547.45	431713.54	49.5	51.5	2	7/14/2021	3.42	50.8
SW-12	861546.84	431794.62	49	51	2	7/14/2021	4.20	51.3
SW-13	861546.56	431874.76	48.5	50.5	2	7/26/2021	3.20	49.3
SW-14	861545.79	431955.20	47	49	2	7/26/2021	3.50	49.6
SW-15	861616.43	431354.05	47	49	2	7/14/2021	3.98	48.9
SW-16	861616.53	431434.89	49	51	2	7/14/2021	3.70	51.4
SW-17	861616.70	431515.71	48.5	50.5	2	7/14/2021	4.90	50.8
SW-18	861614.16	431595.13	50.5	52.5	2	7/14/2021	4.90	52.2
SW-19	861610.69	431678.01	44	46	2	7/14/2021	3.48	46.9
SW-20	861615.36	431754.07	49	51	2	7/14/2021	3.00	51.7
SW-21	861616.10	431835.20	44	46	2	7/14/2021	3.18	47.0
SW-22	861615.57	431915.78	48	50	2	7/14/2021	3.03	50.6
SW-23	861615.07	431994.55	48	50	2	7/14/2021	2.89	51.2
SW-24	861681.89	431398.89	48.5	50.5	2	7/15/2021	3.89	50.6
SW-25	861685.55	431475.35	49	51	2	7/15/2021	4.65	51.1
SW-26	861686.52	431557.34	50	52	2	7/15/2021	4.98	52.5
SW-27	861685.01	431635.01	49.5	51.5	2	7/15/2021	4.44	51.0
SW-28	861685.72	431715.38	49.5	51.5	2	7/15/2021	4.34	50.3
SW-29	861685.51	431794.84	50	52	2	7/15/2021	3.90	52.4
SW-30	861685.50	431874.71	50	52	2	7/15/2021	4.35	52.0
SW-31	861684.83	431954.74	46.8	48.8	2	7/26/2021	2.28	49.3
SW-32	861683.88	432036.94	45.5	47.5	2	7/16/2021	3.05	49.7
SW-33	861685.36	432115.61	46	48	2	7/16/2021	2.81	48.7
SW-34	861689.45	432197.50	42	44	2	7/16/2021	2.28	44.3
SW-35	861685.16	432274.82	42	44	2	7/16/2021	2.13	44.6
SW-36	861751.31	431431.32	47	49	2	7/15/2021	3.40	49.1
SW-37	861752.65	431514.59	49	51	2	7/15/2021	3.65	50.9
SW-38	861754.38	431594.67	48.5	50.5	2	7/15/2021	4.15	50.9
SW-39	861753.89	431754.86	49.5	51.5	2	7/15/2021	4.57	51.6
SW-40	861754.21	431835.00	50	52	2	7/15/2021	4.53	51.6
SW-41	861754.85	431915.25	49.4	51.4	2	7/16/2021	5.25	51.5
SW-42	861755.04	431998.47	49.5	51.5	2	7/16/2021	5.37	51.6
SW-43	861755.08	432075.11	46	48	2	7/16/2021	4.05	48.0
SW-44	861752.75	432155.21	46	48	2	7/16/2021	4.23	48.7
SW-45	861751.45	432237.41	42	44	2	7/16/2021	2.40	44.6
SW-46	861757.45	432322.48	42	44	2	7/16/2021	1.65	44.7
SW-47	861754.60	432395.12	45	47	2	7/16/2021	2.65	47.2
SW-48	861833.84	431469.81	45	47	2	7/15/2021	2.60	47.4
SW-49	861825.95	431551.26	50.5	52.5	2	7/16/2021	6.35	52.2
SW-50	861827.26	431794.98	49	51	2	7/16/2021	4.73	51.6
SW-51	861825.02	431876.55	50	52	2	7/16/2021	5.53	52.0
SW-52	861824.23	431955.28	49.5	51.5	2	7/16/2021	5.50	51.4
SW-53	861823.43	432027.09	46.5	48.5	2	7/16/2021	5.10	48.7
SW-54	861782.23	432116.27	44	46	2	7/16/2021	1.68	45.1
SW-55	861787.16	432199.50	40.5	42.5	2	7/16/2021	2.30	43.0
SW-56	861808.22	432265.58	45.5	47.5	2	7/16/2021	2.63	48.0
SW-57	861823.47	432355.26	46	48	2	7/16/2021	2.80	48.3
SW-58	861754.70	431954.66	49	51	2	7/16/2021	6.28	51.2
SW-59	861788.85	431974.44	48.5	50.5	2	7/16/2021	6.80	49.7
SW-60	861887.87	432076.62	45.5	47.5	2	7/17/2021	3.70	47.3
SW-61	861902.30	432153.94	47	49	2	7/17/2021	4.20	48.9
SW-62	861893.45	432235.20	47	49	2	7/17/2021	2.93	47.4
SW-63	861884.81	432318.74	50.75	52.75	2	7/16/2021	2.71	52.3
SW-64	861905.21	432393.53	50.5	52.5	2	7/16/2021	4.85	53.0
SW-65	861477.74	431513.80	48	50	2	7/14/2021	4.19	49.6
SW-66	861478.48	431554.12	48	50	2	7/14/2021	4.33	50.0
SW-67	861478.33	431635.36	46.5	48.5	2	7/14/2021	4.04	49.9

Notes:
Coordinates in GA STate Plane East NAD 1983
*Measured prior to decommissioning
**Piezometer in marsh w/ 2-ft stick up. DTW from top-of-casing.
NA*- Not applicable. Converted to monitoring well

Table 1. Well Construction Details

Well	X (ft)	Y (ft)	Depth to Top of Screen (ft bgs)	Total Depth (ft bgs)	Diameter (in)	Date of Decommissioning	Depth To Water* (ft bgs)	Total Depth* (ft bgs)
SW-68	861478.08	431714.34	49	51	2	7/14/2021	4.29	51.3
SW-69	861478.05	431794.01	49	51	2	7/14/2021	4.13	51.0
SW-70	861477.72	431874.53	46.5	48.5	2	7/14/2021	3.35	49.3
SW-71	861547.33	431434.05	47.5	49.5	2	7/14/2021	4.16	49.7
SW-72	861547.22	431514.43	47	49	2	7/14/2021	3.67	50.2
SW-73	861546.61	431594.87	48	50	2	7/14/2021	4.20	51.3
SW-74	861547.67	431674.12	49.5	51.5	2	7/14/2021	3.35	51.7
SW-75	861547.61	431752.81	47	50	2	7/14/2021	3.33	50.8
SW-76	861545.73	431834.99	44.75	47.75	2	7/26/2021	2.92	48.1
SW-77	861545.71	431915.06	46	48	2	NA*	2.70	47.7
SW-78	861617.02	431394.06	48	50	2	7/14/2021	5.93	49.3
SW-79	861619.34	431482.47	49.5	51.5	2	7/14/2021	4.89	50.3
SW-80	861614.35	431555.62	49.5	51.5	2	7/14/2021	4.90	52.4
SW-81	861617.18	431634.82	48.5	50.5	2	7/14/2021	3.83	50.5
SW-82	861613.43	431714.45	49	51	2	7/14/2021	4.08	51.7
SW-83	861619.54	431795.22	43.5	45.5	2	7/14/2021	2.64	46.3
SW-84	861616.18	431875.68	46.5	48.5	2	7/14/2021	2.43	47.0
SW-85	861614.76	431954.78	47.5	49.5	2	7/14/2021	3.88	49.6
SW-86	861622.75	432115.42	45	47	2	7/15/2021	3.15	47.1
SW-87	861686.59	431357.05	50	52	2	7/15/2021	4.97	51.5
SW-88	861690.39	431435.81	48.5	50.5	2	7/15/2021	3.45	51.8
SW-89	861685.53	431517.48	49.5	51.5	2	7/15/2021	4.20	51.7
SW-90	861686.30	431598.08	49	51	2	7/15/2021	4.49	51.2
SW-91	861693.90	431837.30	48.5	50.5	2	7/15/2021	4.00	51.3
SW-92	861677.39	431915.66	43	45	2	7/15/2021	2.39	45.7
SW-93	861689.34	431995.33	45.6	47.6	2	7/16/2021	2.68	48.0
SW-94	861686.78	432075.92	44	48	2	7/16/2021	1.97	47.0
SW-95	861687.44	432156.52	42.5	44.5	2	7/16/2021	1.40	43.4
SW-96	861687.01	432236.21	41	43	2	7/16/2021	1.90	42.1
SW-97	861750.75	431392.35	49	51	2	7/15/2021	3.86	51.5
SW-98	861752.46	431473.51	49	51	2	7/15/2021	3.86	50.9
SW-99	861754.17	431554.83	50	52	2	7/15/2021	4.07	51.8
SW-100	861754.07	431874.98	49	51	2	7/15/2021	4.38	51.7
SW-101	861754.76	432036.58	42.5	44.5	2	7/16/2021	1.98	44.0
SW-102	861754.12	432115.13	43	45	2	7/16/2021	1.80	43.7
SW-103	861752.21	432195.84	42	44	2	7/16/2021	2.05	42.2
SW-104	861753.09	432279.61	41.6	43.6	2	7/16/2021	1.58	43.6
SW-105	861757.36	432361.29	44	46	2	7/16/2021	2.80	46.6
SW-106	861830.41	431510.45	49	51	2	7/15/2021	3.59	51.9
SW-107	861820.79	431593.16	51	53	2	7/16/2021	4.35	53.2
SW-108	861825.78	431835.98	48.75	50.75	2	7/16/2021	4.30	51.6
SW-109	861824.10	431916.55	49	51	2	7/16/2021	5.38	51.6
SW-110	861823.25	431991.60	49	51	2	7/16/2021	6.82	51.9
SW-111	861790.59	432041.77	46	48	2	7/16/2021	2.08	47.9
SW-112	861784.50	432157.60	43	45	2	7/16/2021	2.00	45.5
SW-113	861796.46	432233.03	42	44	2	7/16/2021	2.60	43.6
SW-114	861816.07	432315.76	45	47	2	7/16/2021	2.10	47.3
SW-115R	861817.19	432402.73	44.5	46.5	2	7/16/2021	3.45	47.7
SW-116	861858.46	432051.83	46	50	2	7/17/2021	2.67	50.3
SW-117	861868.39	432094.36	45.5	47.5	2	7/17/2021	4.33	48.2
SW-118	861874.62	432161.60	44	46	2	7/17/2021	2.90	47.0
SW-119	861873.14	432262.24	45	49	2	7/17/2021	2.60	48.4
SW-120	861901.69	432358.17	50	52	2	7/16/2021	3.33	52.2
SW-121	861885.31	432020.27	48	50	2	7/16/2021	3.25	49.4
SW-122	861895.67	432115.28	50	52	2	7/17/2021	3.94	52.3
SW-123	861898.46	432194.71	43	45	2	7/17/2021	3.20	46.2
SW-124	861259.30	431445.99	44.5	46.5	2	7/13/2021	2.37	46.7
SW-125	861315.37	431347.69	46	48	2	7/13/2021	4.65	48.7
SW-126	861319.34	431541.15	46	48	2	7/13/2021	3.62	49.0
SW-127	861375.28	431249.92	48.5	50.5	2	7/13/2021	4.00	49.9
SW-128	861375.45	431444.35	47	49	2	7/13/2021	4.18	50.0
SW-129	861372.08	431643.48	46.5	48.5	2	7/14/2021	3.66	49.7
SW-130	861431.76	431149.00	47	49	2	7/13/2021	4.10	49.3
SW-131	861434.13	431349.41	48.8	50.5	2	7/13/2021	4.75	50.4
SW-132	861428.17	431544.55	48.5	50.5	2	7/14/2021	5.43	51.3
SW-133	861499.43	431246.02	49	51	2	7/12/2021	2.60	51.0
SW-134	861538.58	431155.43	47.5	49.5	2	7/12/2021	3.60	50.1
SW-135	861602.24	431247.77	46	48	2	7/15/2021	5.12	48.6

Notes:
Coordinates in GA STate Plane East NAD 1983
*Measured prior to decommissioning
**Piezometer in marsh w/ 2-ft stick up. DTW from top-of-casing.
NA*- Not applicable. Converted to monitoring well

Table 1. Well Construction Details

Well	X (ft)	Y (ft)	Depth to Top of Screen (ft bgs)	Total Depth (ft bgs)	Diameter (in)	Date of Decommissioning	Depth To Water* (ft bgs)	Total Depth* (ft bgs)
SW-136	861661.50	431136.37	46	48	2	7/15/2021	3.80	48.6
SW-137	861717.84	431245.75	48	50	2	7/15/2021	5.15	50.3
SW-138	861773.81	431148.46	48	50	2	7/15/2021	4.10	50.6
SW-139	861773.84	431347.60	48.5	50.5	2	7/15/2021	3.75	51.0
SW-140	861831.33	431248.04	49.5	51.5	2	7/15/2021	5.60	52.0
SW-141	861888.30	431149.20	49	51	2	7/15/2021	4.50	51.9
SW-142	861887.52	431346.27	49	51	2	7/15/2021	4.93	52.1
SW-143	861946.87	431247.65	48	50	2	7/15/2021	3.55	51.1
SW-144	861945.81	431444.33	47	49	2	7/15/2021	4.09	50.0
SW-145	862003.35	431346.62	48	50	2	7/15/2021	3.89	51.1
SW-146	861260.51	431248.40	46.5	48.5	2	7/13/2021	3.80	49.2
SW-147	861264.18	431311.02	46	48	2	7/13/2021	3.30	47.3
SW-148	861318.16	431149.48	46	48	2	7/13/2021	4.80	48.7
SW-149	861315.78	431216.09	48.4	50.4	2	7/13/2021	6.30	50.0
SW-150	861318.20	431281.96	46.5	48.5	2	7/13/2021	4.80	47.5
SW-151	861316.42	431611.39	44.5	46.5	2	7/14/2021	2.55	47.5
SW-152	861316.82	431678.01	45.5	47.5	2	7/14/2021	3.43	48.5
SW-153	861374.45	431114.61	47.5	49.5	2	7/13/2021	4.60	49.3
SW-154	861374.52	431183.13	45.5	47.5	2	7/13/2021	5.20	48.7
SW-155	861374.26	431315.90	47	49	2	7/13/2021	4.78	50.5
SW-156	861372.28	431379.48	47	49	2	7/13/2021	4.70	50.3
SW-157	861373.50	431513.00	46.5	48.5	2	7/13/2021	3.85	49.7
SW-158	861373.69	431577.94	47.5	49.5	2	7/14/2021	3.60	50.1
SW-159	861374.54	431710.83	46.5	48.5	2	7/14/2021	3.45	49.3
SW-160	861430.25	431083.99	47	49	2	7/12/2021	4.80	49.2
SW-161	861431.91	431214.83	48	50	2	7/13/2021	3.60	49.5
SW-162	861431.78	431280.33	47.5	49.5	2	7/13/2021	3.10	50.2
SW-163	861432.24	431411.73	47	49	2	7/13/2021	4.56	50.3
SW-164	861429.50	431481.62	49.5	51.5	2	7/14/2021	5.53	51.8
SW-165	861430.68	431610.80	47.5	49.5	2	7/14/2021	4.75	50.2
SW-166	861430.34	431677.36	47.5	49.5	2	7/14/2021	4.20	50.5
SW-167	861431.86	431745.16	48.5	50.5	2	7/14/2021	3.50	50.6
SW-168	861489.05	431115.37	46	48	2	7/12/2021	2.60	48.6
SW-169	861488.72	431181.71	46.5	48.5	2	7/12/2021	3.30	49.2
SW-170	861490.20	431314.67	48.5	50.5	2	7/13/2021	4.37	50.4
SW-171	861488.13	431380.19	47.5	49.5	2	7/13/2021	4.70	50.6
SW-172	861488.93	431446.34	47	49	2	7/14/2021	4.48	50.7
SW-173	861546.37	431083.02	47	49	2	7/12/2021	4.10	50.3
SW-174	861546.26	431215.68	48.5	50.5	2	7/14/2021	5.10	49.7
SW-175	861546.07	431282.74	48	50	2	7/12/2021	4.35	50.3
SW-176	861545.99	431346.46	45	47	2	7/13/2021	4.40	47.6
SW-177	861590.45	431123.09	50	52	2	7/12/2021	4.10	52.9
SW-178	861588.84	431182.72	50	52	2	7/12/2021	5.40	52.5
SW-179	861602.94	431314.46	47	49	2	7/16/2021	4.20	48.8
SW-180	861658.74	431213.25	47	49	2	7/15/2021	3.58	50.5
SW-181	861659.32	431282.17	48.5	50.5	2	7/15/2021	4.63	49.6
SW-182	861717.58	431182.12	50	52	2	7/15/2021	3.90	52.7
SW-183	861717.04	431314.22	50	52	2	7/15/2021	5.13	52.4
SW-184	861774.00	431215.12	52	54	2	7/15/2021	5.86	54.2
SW-185	861773.71	431282.92	50	52	2	7/15/2021	3.74	52.6
SW-186	861832.13	431181.83	51.25	53.25	2	7/15/2021	5.20	53.4
SW-187	861832.33	431313.65	50	52	2	7/15/2021	4.45	52.7
SW-188	861832.76	431379.45	50	52	2	7/15/2021	4.20	52.6
SW-189	861888.51	431215.41	46	48	2	7/15/2021	3.83	47.0
SW-190	861889.98	431280.90	49	51	2	7/15/2021	3.85	52.2
SW-191	861888.72	431413.24	50	52	2	7/15/2021	4.85	52.5
SW-192	861890.38	431479.32	48.5	50.5	2	7/15/2021	3.88	51.4
SW-193	861944.21	431181.44	52.5	54.5	2	7/15/2021	4.90	55.0
SW-194	861945.66	431325.44	47	49	2	7/15/2021	3.68	49.3
SW-195	861946.05	431380.44	49.5	51.5	2	7/15/2021	4.05	51.9
SW-196	861615.66	432037.15	47.5	49.5	2	7/14/2021	3.20	49.7
SW-197	861621.33	432082.96	47	49	2	NA*	1.75	49.5
SW-198	861873.39	431921.66	46	48	2	7/16/2021	4.25	47.6
SW-199	861860.60	431979.15	45	47	2	7/16/2021	2.20	46.5
SW-200	861900.82	431801.20	51	53	2	7/16/2021	5.70	54.0
SW-201	861907.79	431851.65	53	55	2	7/16/2021	7.57	56.1
SW-202	861914.17	431901.13	45.5	47.5	2	7/16/2021	4.23	48.4
SW-203	861919.94	431950.32	46	48	2	7/16/2021	4.55	48.6

Notes:
Coordinates in GA STate Plane East NAD 1983
*Measured prior to decommissioning
**Piezometer in marsh w/ 2-ft stick up. DTW from top-of-casing.
NA*- Not applicable. Converted to monitoring well

Table 1. Well Construction Details

Well	X (ft)	Y (ft)	Depth to Top of Screen (ft bgs)	Total Depth (ft bgs)	Diameter (in)	Date of Decommissioning	Depth To Water* (ft bgs)	Total Depth* (ft bgs)
SW-204	861925.99	431998.84	45.5	47.5	2	7/16/2021	3.90	47.9
SW-205	861932.46	432046.28	46	48	2	7/17/2021	4.60	48.4
SW-206	861938.56	432097.25	45.5	47.5	2	7/17/2021	4.24	47.6
SW-207	861946.07	432144.07	50	52	2	7/17/2021	4.80	52.5
SW-208	861952.38	432195.42	50	52	2	7/17/2021	4.75	52.7
SW-209	861957.00	432245.44	50	52	2	7/17/2021	4.38	51.5
SW-210	862000.52	431719.76	43	45	2	7/17/2021	4.43	45.5
SW-211	861947.78	431757.44	40.5	42.5	2	7/17/2021	4.07	43.0
SW-212	861959.29	431820.67	43.5	45.5	2	7/17/2021	4.65	47.0
SW-213	862008.76	431783.53	44	46	2	7/17/2021	4.90	46.3
SW-214	862065.47	431809.09	47	49	2	7/17/2021	5.65	49.6
SW-215	862017.35	431848.64	43.5	45.5	2	7/17/2021	4.97	46.8
SW-216	861969.64	431883.88	43.5	45.5	2	7/17/2021	4.73	45.2
SW-217	862128.65	431827.65	46.5	48.5	2	7/17/2021	5.25	49.8
SW-218	862079.10	431870.04	45.5	47.5	2	7/17/2021	5.22	48.2
SW-219	862026.51	431904.29	44.5	46.5	2	7/17/2021	4.98	47.5
SW-220	861975.14	431945.17	44	46	2	7/17/2021	4.80	46.6
SW-221	862137.66	431890.97	44.5	46.5	2	7/17/2021	5.10	47.5
SW-222	862086.98	431931.80	44.5	46.5	2	7/17/2021	5.28	47.4
SW-223	862034.59	431965.36	43	45	2	7/17/2021	4.80	45.5
SW-224	861982.54	432000.88	43	45	2	7/17/2021	4.58	45.5
SW-225	862131.37	431951.87	45.5	47.5	2	7/17/2021	4.95	48.6
SW-226	862091.33	431995.52	43	45	2	7/17/2021	4.90	45.3
SW-227	862036.40	432031.00	43.5	45.5	2	7/17/2021	4.45	46.6
SW-228	861993.52	432065.46	42.5	44.5	2	7/17/2021	4.25	44.6
SW-229	862152.48	432012.31	44	46	2	7/17/2021	5.05	46.4
SW-230	862100.51	432052.30	44	46	2	7/17/2021	5.15	46.5
SW-231	862050.83	432088.21	41.5	43.5	2	7/17/2021	4.75	44.5
SW-232	861995.91	432128.61	46.5	48.5	2	7/17/2021	4.40	49.9
SW-233	862204.47	432035.71	44	46	2	7/17/2021	5.00	46.9
SW-234	862157.09	432074.98	43.5	45.5	2	7/17/2021	4.78	45.9
SW-235	862108.05	432109.18	41.5	43.5	2	7/17/2021	4.65	44.7
SW-236	862207.48	432100.10	44	46	2	7/17/2021	4.85	45.7
SW-237	862055.74	432150.54	42.5	44.5	2	7/17/2021	4.65	45.5
SW-238	862164.69	432140.93	39.5	41.5	2	7/17/2021	4.86	42.7
SW-239	862110.53	432172.13	40.5	42.5	2	7/17/2021	4.40	43.6
SW-240	862060.80	432212.11	42	44	2	7/17/2021	4.37	44.9
SW-241	862169.56	432200.19	43	45	2	7/17/2021	4.50	45.5
SW-242	862004.84	432180.80	43.5	45.5	2	7/17/2021	4.33	46.5
SW-243	862009.11	432242.47	41	43	2	7/17/2021	3.97	43.4
SW-244	862113.97	432234.48	41	43	2	7/17/2021	2.90	43.8
SW-245	862171.93	432255.18	40	42	2	7/16/2021	2.29	42.4
SW-246	862128.23	432279.28	40	42	2	7/16/2021	2.58	42.6
SW-247	862062.03	432284.66	38	40	2	7/16/2021	2.47	40.6
SW-248	861992.50	432309.91	43	45	2	7/16/2021	4.15	44.9
SW-249	861945.26	432309.03	41.5	43.5	2	7/16/2021	3.55	44.3
SW-250	862088.22	432341.90	41.5	43.5	2	7/16/2021	2.85	44.4
SW-251	862030.74	432345.19	38	40	2	7/17/2021	2.85	40.6
SW-252	861977.35	432373.40	39	41	2	7/16/2021	3.38	41.7
SW-253	862006.76	432407.40	39	41	2	7/16/2021	2.90	41.8
SW-254	861945.99	432416.35	39	41	2	7/16/2021	2.94	41.7
SW-255	861979.28	432460.33	40	42	2	7/16/2021	2.97	42.8
SW-256	861924.25	432467.13	41.5	43.5	2	7/16/2021	3.38	44.7
SW-257	861946.16	432505.83	38.5	40.5	2	7/16/2021	3.28	42.3
SW-258	862006.42	432515.97	39.5	41.5	2	7/16/2021	3.15	42.6
SW-259	861968.89	432559.88	39.5	41.5	2	7/16/2021	2.85	42.5
SW-260	862025.47	432574.06	38.5	40.5	2	7/16/2021	2.90	41.9
SW-261	862086.30	432400.55	41.5	43.5	2	7/16/2021	3.15	45.0
SW-262	862064.08	432518.26	41.5	43.5	2	7/16/2021	2.98	44.8
SW-263	862098.80	432458.88	41.5	43.5	2	7/16/2021	3.15	44.5
SW-264	862037.34	432464.09	41.5	43.5	2	7/16/2021	3.30	44.2
SW-265	861857.48	432448.81	41.5	43.5	2	7/16/2021	4.20	44.1
SW-266	861848.04	432520.76	43.5	45.5	2	7/16/2021	5.25	46.6
SW-267	861816.87	432493.13	48.5	50.5	2	7/16/2021	4.85	50.8
CO_2 Treatment Performance Monitoring Piezometers								
PZ-5	861479.49	431838.04	2	7	2	7/17/2021	1.73	6.9
PZ-9	861548.93	431557.49	2	7	2	7/14/2021	1.50	6.9
PZ-11	861549.19	431715.43	2	7	2	7/14/2021	0.85	7.6
PZ-13	861550.46	431875.80	2	7	2	7/26/2021	1.00	7.1

Notes:
Coordinates in GA STate Plane East NAD 1983
*Measured prior to decommissioning
**Piezometer in marsh w/ 2-ft stick up. DTW from top-of-casing.
NA*- Not applicable. Converted to monitoring well

Table 1. Well Construction Details

Well	X (ft)	Y (ft)	Depth to Top of Screen (ft bgs)	Total Depth (ft bgs)	Diameter (in)	Date of Decommissioning	Depth To Water* (ft bgs)	Total Depth* (ft bgs)
PZ-14	861545.72	431957.40	2	7	2	7/26/2021	1.10	6.9
PZ-16	861619.69	431435.20	2	7	2	7/14/2021	1.49	6.7
PZ-20	861611.01	431755.69	2	7	2	7/14/2021	1.05	7.0
PZ-22	861615.28	431918.21	2	7	2	7/14/2021	1.65	7.2
PZ-28	861688.59	431714.70	2	7	2	7/15/2021	1.95	7.0
PZ-32	861681.39	432039.44	2	7	2	7/16/2021	1.28	6.7
PZ-35	861685.59	432278.15	2	7	2	7/16/2021	1.60	6.9
PZ-40	861751.57	431836.15	2	7	2	7/15/2021	2.10	6.7
PZ-43	861757.51	432077.29	2	7	2	7/16/2021	1.67	7.0
PZ-46	861761.09	432325.10	2	7	2	7/16/2021	1.45	7.0
PZ-58	861752.66	431952.08	2	7	2	7/16/2021	2.02	7.0
PZ-63	861881.60	432319.88	2	7	2	7/16/2021	2.10	6.3
PZ-66	861478.92	431550.17	2	7	2	7/14/2021	1.63	7.7
PZ-67	861482.46	431633.99	2	7	2	7/14/2021	1.39	7.4
PZ-71	861546.03	431438.06	2	7	2	7/14/2021	2.04	7.6
PZ-79	861621.56	431485.85	2	7	2	7/14/2021	1.80	7.7
PZ-89	861683.97	431520.20	2	7	2	7/15/2021	1.70	7.2
PZ-96	861688.19	432239.55	2	7	2	7/16/2021	2.00	7.6
PZ-106	861830.17	431505.17	2	7	2	7/15/2021	1.40	7.3
PZ-112	861787.67	432156.95	2	7	2	7/16/2021	1.75	7.4
PZ-114	861813.11	432316.37	2	7	2	7/16/2021	1.20	7.4
PZ-124	861261.55	431442.37	2	7	2	7/13/2021	2.77	7.5
PZ-125	861318.92	431347.49	2	7	2	7/13/2021	1.70	7.4
PZ-126	861320.37	431538.49	2	7	2	7/13/2021	1.72	7.2
PZ-127	861379.41	431250.14	2	7	2	7/13/2021	1.50	6.5
PZ-128	861378.52	431441.86	2	7	2	7/13/2021	2.67	6.6
PZ-135	861600.81	431250.40	2	7	2	7/15/2021	0.35	7.0
PZ-138	861778.54	431146.33	2	7	2	7/15/2021	1.90	7.5
PZ-139	861775.93	431344.59	2	7	2	7/15/2021	1.42	7.6
PZ-140	861827.17	431249.25	2	7	2	7/15/2021	2.13	7.2
PZ-144	861948.28	431441.85	2	7	2	7/15/2021	2.08	6.8
CO_2 Treatment Proof of Concept Performance Monitoring Wells								
MW-1A	861702.34	431508.27	15	20	2	7/15/2021	2.78	20.6
MW-1B	861704.51	431512.61	30	35	2	7/15/2021	2.52	35.4
MW-1C	861708.52	431516.04	45	50	2	7/15/2021	3.84	48.5
MW-2A	861710.80	431494.60	15	20	2	7/15/2021	2.58	20.4
MW-2B	861717.31	431497.64	30	35	2	7/15/2021	2.47	35.5
MW-2C	861721.98	431501.28	45	50	2	7/15/2021	3.08	50.1
MW-3A	861679.10	431537.44	15	20	2	7/15/2021	3.34	20.5
Phytoremediation Pilot Piezometers								
P-1A	861380.00	431193.81	Unk	Unk	1	7/19/2021	2.20	8.5
P-1B	861316.25	431255.38	Unk	Unk	1	7/19/2021	2.78	7.5
P-1C	861239.38	431322.94	Unk	Unk	1	7/19/2021	1.75	6.3
P-1D	861167.56	431360.41	Unk	Unk	1	7/19/2021	3.18	8.1
P-2A	861332.75	431069.13	Unk	Unk	1	7/19/2021	3.11	8.6
P-2B	861236.06	431120.69	Unk	Unk	1	7/19/2021	2.84	8.2
P-2C	861140.50	431173.66	Unk	Unk	1	7/19/2021	1.85	6.8
P-2D	861058.13	431226.31	Unk	Unk	1	7/19/2021	0.63** (BTOC)	7.4
P-3A	861294.13	430924.13	Unk	Unk	1	7/19/2021	2.94	8.1
P-3B	861198.13	430949.38	Unk	Unk	1	7/19/2021	3.53	8.1
P-3C	861102.38	430975.25	Unk	Unk	1	7/19/2021	2.03	7.9
P-3D	861004.75	430992.97	Unk	Unk	1	7/19/2021	0.74** (BTOC)	8.3

Notes:
Coordinates in GA STate Plane East NAD 1983
*Measured prior to decommissioning
**Piezometer in marsh w/ 2-ft stick up. DTW from top-of-casing.
NA*- Not applicable. Converted to monitoring well

MONTROSE ENVIRONMENTAL

Attachment #1
Photographic Log

PHOTOGRAPHIC LOG

SITE:	LCP Chemicals Superfund Site (Brunswick, GA)
DATE:	July 12-27, 2021

No.	Description
1	Equipment used to mix neat cement grout mixture, including tote and pneumatic mixer.
2	Grout placed in well by tremie method. Equipment shown includes 1-inch diameter diaphragm pump and associated hosing/piping.
3	Grout placed in riser up to land surface prior to removing well pad and cutting riser below grade.
4	Pads removed with skid steer and placed in roll off containers for disposal.
5	Well riser cut below grade.
6	Topping off grout after removal of well pad.
7	Restoration of well pad footprint with topsoil.
8	Sparge well SW-77 converted to monitoring well.
9	Sparge well SW-197 converted to a monitoring well.

MONTROSE ENVIRONMENTAL

Photo	*1*	*Equipment used to mix neat cement grout mixture, including tote and pneumatic mixer.*

Photo	*2*	*Grout placed in well by tremie method. Equipment shown includes 1-inch diameter diaphragm pump and associated hosing/piping.*

Photo	*3*	*Grout placed in riser up to land surface prior to removing well pad and cutting riser below grade.*

Photo	*4*	Pads removed with skid steer and placed in roll off containers for disposal.

Photo	*5*	*Well riser cut below grade.*

Photo	*6*	*Topping off grout after removal of well pad.*

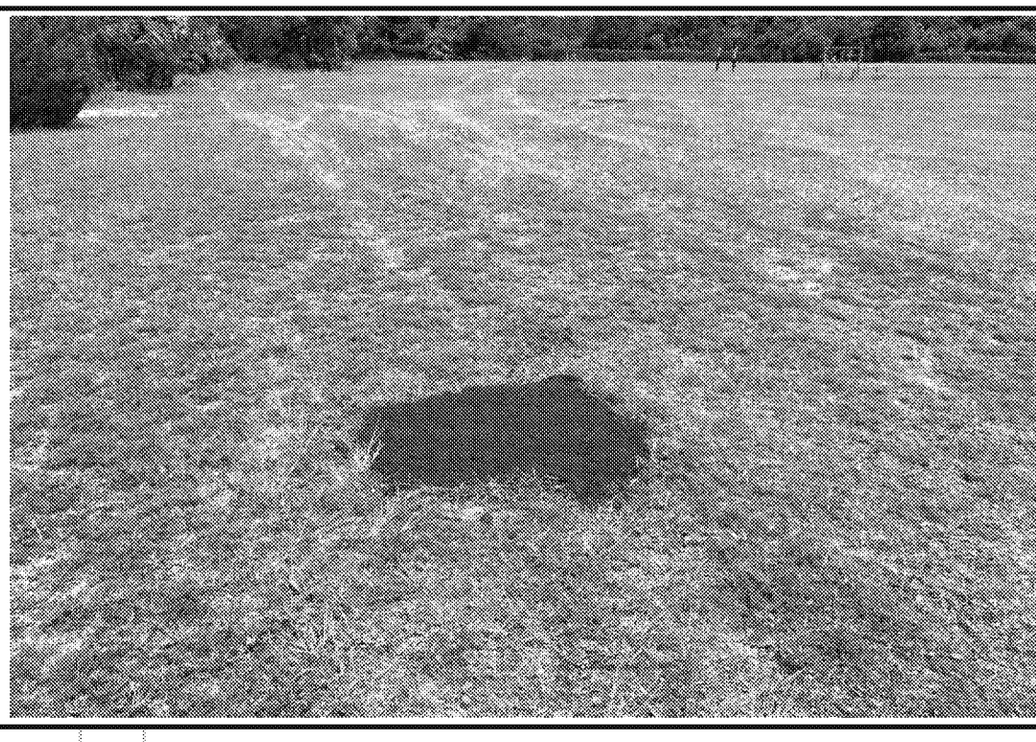

Photo	*7*	*Restoration of well pad footprint with topsoil.*

Photo	*8*	*Sparge well SW-77 converted to monitoring well.*

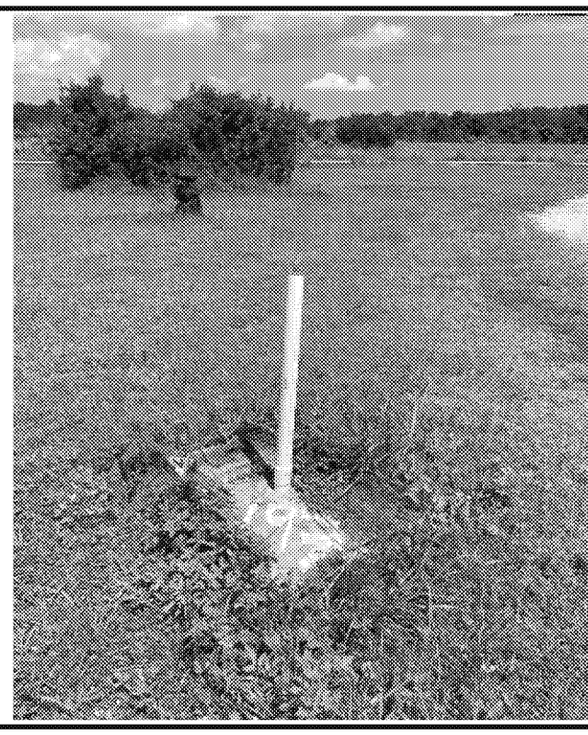

Photo	*9*	*Sparge well SW-197 converted to a monitoring well.*

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