JUNE 2022

On-Post
Quarterly Groundwater Monitoring Report

Prepared For

Department of the Army
Camp Stanley Storage Activity
Boerne, Texas

August 2022

EXECUTIVE SUMMARY

- Groundwater samples were collected from 4 of 43 on-post wells scheduled for sampling at Camp Stanley Storage Activity (CSSA) in June 2022.
- CSSA experienced below average rainfall during the second quarter of 2022 and the aquifer experienced a decrease from March to June 2022. The CSSA weather station (WS) at AOC-65 recorded 3.74 inches of rainfall from April to June and the MW18-WS recorded 5.1 inches during this period. The average rainfall for the Boerne area from April to June is 11.75 inches.
- At CSSA, the Middle Trinity aquifers' average groundwater elevation in June decreased 24.31 feet from the elevations measured in March 2022 and the water table fell to 75 feet below the 15-year average (2007-2021). The average depth to water in the wells was 295.38 feet below top of casing (BTOC) or 947.60 feet above mean sea level (MSL). As such, the Trinity-Glen Rose Groundwater Conservation District (TGRGCD) remains in 'Stage 2' conservation measures. For the adjacent Edwards aquifer, the San Antonio Water System (SAWS) also remains in 'Stage 2' watering restrictions implemented April 12, 2022.
- The maximum contaminant level (MCL) for VOCs was not exceeded in wells sampled in June 2022.
- No wells sampled had metal detections above their corresponding MCL, action level (AL), or secondary standard (SS) in June 2022.
- Four Westbay® Well zones were sampled in June 2022. These zones showed a significant drop in PCE concentrations since last sampled in March 2022. Increased sampling frequency (quarterly) in these lower WB04 zones is recommended due to recent increasing VOC concentration trends. The remaining intervals should remain on the 15- and 30-month sampling schedules in the future as recommended in the LTMO study.
- All samples collected in June 2022 were in accordance with the 2020 update to the long-term monitoring optimization (LTMO) report that has been approved by the TCEQ and USEPA.

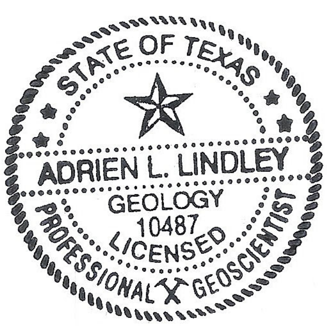
GEOSCIENTIST CERTIFICATION

JUNE 2022 ON-POST QUARTERLY GROUNDWATER MONITORING REPORT

FOR

DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

I, Adrien Lindley, Professional Geologist (P.G.), hereby certify that the June 2022 On-Post Quarterly Groundwater Monitoring Report for the Camp Stanley Storage Activity installation in Boerne, Texas accurately represents the site conditions of the subject area. This certification is limited only to geoscientific products contained in the subject report and is made on the basis of written and oral information provided by the CSSA Environmental Office, laboratory data provided by Eurofins TestAmerica Laboratories, and field data obtained during groundwater monitoring conducted at the site in June 2022 and is true and accurate to the best of my knowledge and belief.



Adrien Lindley, P.G.
State of Texas
Geology License No. 10487

8/1/2022
Date

Parsons Government Services, Inc.
Firm Registration No. 50316

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

µg/L	microgram per liter
§3008(h) Order	RCRA 3008(h) Administrative Order on Consent
AL	Action Level
AOC	Area of Concern
BS	Bexar Shale
BTOC	below top of casing
CC	Cow Creek
cis-1,2-DCE	*cis*-1,2-Dichloroethene
COC	constituents of concern
CSSA	Camp Stanley Storage Activity
DQO	Data Quality Objectives
ETA	Eurofins TestAmerica Laboratory
HSP	Health and Safety Plan
ISCO	In-Situ Chemical Oxidation
LGR	Lower Glen Rose
LTMO	Long-Term Monitoring Optimization
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MSL	mean sea level
NA	Not Available
PCE	Tetrachloroethene
P.G.	Professional Geologist
Parsons	Parsons Government Services, Inc.
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SAWS	San Antonio Water System
SS	Secondary Standard
SWMU	Solid Waste Management Units
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
TGRGCD	Trinity-Glen Rose Groundwater Conservation District
UGR	Upper Glen Rose
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WS	Weather Station

JUNE 2022
GROUNDWATER MONITORING REPORT
CAMP STANLEY STORAGE ACTIVITY, TEXAS

1.0 INTRODUCTION

This report presents results from the on-post quarterly sampling performed at Camp Stanley Storage Activity (CSSA) in June 2022. Laboratory analytical results are presented along with potentiometric contour maps. Results from all four 2022 quarterly monitoring events (March, June, September, and December) will be described in detail in the 2022 Annual Report. The Annual Report will also provide an interpretation of all analytical results, present updated plume maps, and include an evaluation of any temporal or spatial trends observed in the groundwater contaminant plume during investigations and include revised VOC plume maps based on analytical results. For this specific quarter, groundwater monitoring was performed June 1st through 15th, 2022 by Parsons Government Services, Inc. (Parsons).

Current objectives of the groundwater monitoring program are to determine groundwater flow direction and elevations, determine groundwater contaminant concentrations for characterization purposes, and identify meteorological and seasonal variations in physical and chemical properties. **Appendix A** identifies the data quality objectives (DQOs) for CSSA's groundwater monitoring program, along with an evaluation of whether each DQO was attained. The objectives listed in **Appendix A** also reference appropriate sections of the Resource Conservation and Recovery Act (RCRA) **§3008(h) Administrative Order on Consent** [§3008(h) Order].

The CSSA groundwater monitoring program follows the provisions of the groundwater monitoring program DQOs as well as the recommendations of the **Three-Tiered Long Term Monitoring Network Optimization (LTMO) Evaluation (Parsons, 2015)** which provided recommendations for sampling based on an LTMO study performed for the CSSA groundwater monitoring program. The LTMO evaluation was updated in 2020 using groundwater data from monitoring conducted between 2015 and 2019. The proposed LTMO changes/updates were approved by the TCEQ and USEPA on September 18, 2020. The updated LTMO study sampling frequencies were implemented in December 2020.

2.0 POST-WIDE FLOW DIRECTION AND GRADIENT

Below average rainfall in the first half of the year showed the aquifer decline significantly from the end of 2021. In the second quarter of 2022 (April - June) the aquifer levels sustained a net loss of 24.31 feet in average water level elevation beneath CSSA and the water table falls to 75 feet below the 15-year average (2007-2021). In the second quarter of 2022, recorded rainfall was below average with 3.74 inches at the AOC-65 WS and 5.10 inches at the MW18 WS. The average rainfall from April through June for the Boerne area is 11.75 inches. The San Antonio Water System (SAWS) restrictions were moved to 'Stage 2' on April 12, 2022. SAWS has been under 'Stage 1" water restrictions since March 10, 2022. The Trinity-Glen Rose Groundwater Conservation District (TGRGCD) also moved to 'Stage 2' watering restrictions in May 2022.

The 30-year precipitation normal for the San Antonio area for the three-month period of April through June is 10.16 inches of rainfall. Over the 3-month period of record, the MW18 and AOC-65 weather stations at CSSA, recorded 5.10/3.74 inches of rainfall (0.52/0.39 inches in April, 1.82/1.52 inches in May, and 2.76/1.83 inches in June) respectively. Of the 14/14 rain events at the MW18 WS and AOC-65 WS during this timeframe, one event (June 28) had a daily rainfall total in excess of 1 inch.

Fifty-five water level measurements were recorded on June 15, 2022, from on- and off-post monitoring wells completed in the Lower Glen Rose (LGR), Bexar Shale (BS), and Cow Creek (CC) formational members of the Middle Trinity Aquifer (**Tables 2.1 and 2.2**). The groundwater potentiometric surface maps illustrating groundwater elevations from the LGR, BS, and CC zones in June 2022 are shown in **Figures 2.1, 2.2, and 2.3**, respectively.

The June 2022 potentiometric surface map for LGR-screened wells (**Figure 2.1**) exhibits a wide range of groundwater elevations, from a minimum of 884.96 feet above mean sea level (MSL) at CS-MW11A-LGR to a maximum of 1,006.96 feet above MSL at CS-MWH-LGR. Groundwater elevations are generally higher in the northern and central portions of CSSA and decrease to the southeast. As measured in all LGR screened wells, the average groundwater elevation measured in June 2022 was 949.43 feet above MSL. This is 79.45 feet below the 19.75-year average LGR groundwater elevation for the area (1028.88 feet) (**Figure 2.4**). Also shown in that figure is the 3-month precipitation total (2.73 inches) recorded at the San Antonio International Airport weather station (KSAT) and the resultant aquifer response. In June, an average decrease in LGR groundwater elevation of 21.32 feet was observed within CSSA LGR monitoring wells from the previous quarter.

Well CS-MW4-LGR, located in the central portion of CSSA, typically has one of the highest groundwater elevations of LGR-screened wells. During average and above-average aquifer elevations, the groundwater level is 20 to 30 feet higher than the nearest comparable wells (CS-MW2-LGR and CS-MW5-LGR), creating a pronounced groundwater mound in the central portion of the facility. Long-term monitoring has ascertained that when groundwater near CS-MW4-LGR rises above about 970 feet MSL, the mounding effect is evident. In June 2022, this mounding was observed, though less perceptible than in previous quarters, as the groundwater elevation at CS-MW4-LGR (970.99 feet MSL) was 4.53 feet higher than CS-MW2-LGR (966.46 feet MSL) and 7.05 feet higher than CS-MW5-LGR (963.94 feet MSL).

Table 2.1
Measured Groundwater Elevation
June 2022

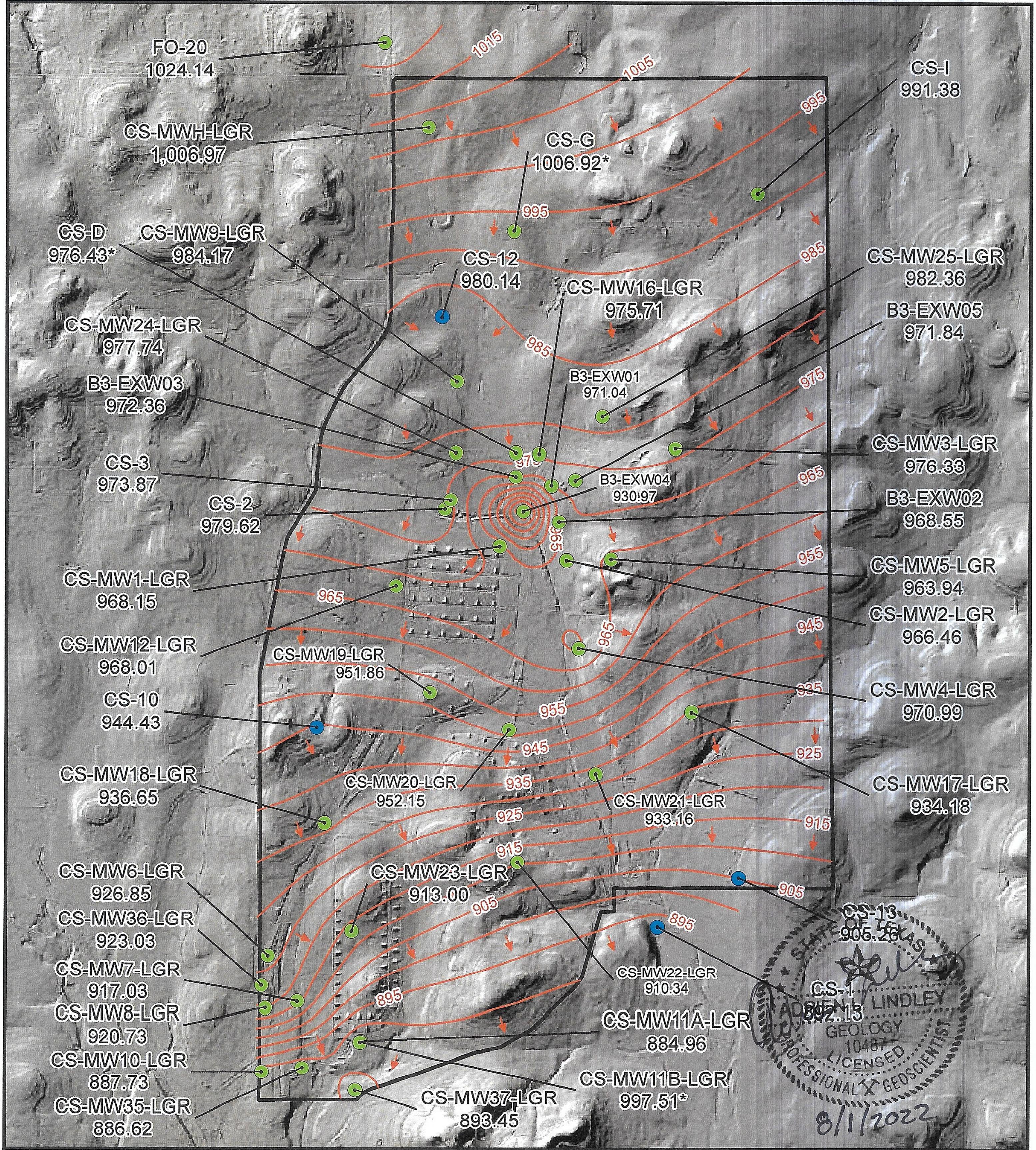
Well ID:	TOC elevation (ft MSL)	Depth to Groundwater (ft BTOC)	Groundwater Elevation (ft MSL)	Formations Screened			Date
				LGR	BS	CC	
CS-1	1169.27	277.14	892.13	ALL			6/15/2022
CS-2	**1237.59**	**257.97**	979.62	X	?		6/15/2022
CS-3	1240.17	266.30	973.87	X			6/15/2022
CS-10	**1331.51**	**387.08**	944.43	ALL			6/15/2022
CS-12	**1274.09**	**293.95**	980.14	ALL			6/15/2022
CS-13	**1193.26**	**288.00**	905.26	ALL			6/15/2022
CS-D	1236.03	259.60	976.43	X			6/15/2022
CS-MWG-LGR	1328.14	321.22	1006.92	X			6/15/2022
CS-MWH-LGR	1319.19	312.23	1006.96	X			6/15/2022
CS-I	1315.20	323.82	991.38	X			6/15/2022
CS-MW1-LGR	1220.73	252.58	968.15	X			6/15/2022
CS-MW1-BS	1221.09	249.24	971.85		X		6/15/2022
CS-MW1-CC	1221.39	269.66	951.73			X	6/15/2022
CS-MW2-LGR	1237.08	270.62	966.46	X			6/15/2022
CS-MW2-CC	1240.11	288.45	951.66			X	6/15/2022
CS-MW3-LGR	1334.14	357.81	976.33	X			6/15/2022
CS-MW4-LGR	1209.71	238.72	970.99	X			6/15/2022
CS-MW5-LGR	1340.24	376.30	963.94	X			6/15/2022
CS-MW6-LGR	1232.25	305.40	926.85	X			6/15/2022
CS-MW6-BS	1232.67	318.85	913.82		X		6/15/2022
CS-MW6-CC	1233.21	320.30	912.91			X	6/15/2022
CS-MW7-LGR	1202.27	285.24	917.03	X			6/15/2022
CS-MW7-CC	1201.84	299.00	902.84			X	6/15/2022
CS-MW8-LGR	1208.35	287.62	920.73	X			6/15/2022
CS-MW8-CC	1206.13	301.30	904.83			X	6/15/2022
CS-MW9-LGR	1257.27	273.10	984.17	X			6/15/2022
CS-MW9-BS	1256.73	271.10	985.63		X		6/15/2022
CS-MW9-CC	1255.95	305.17	950.78			X	6/15/2022
CS-MW10-LGR	1189.53	301.80	887.73	X			6/15/2022
CS-MW10-CC	1190.04	309.15	880.89			X	6/15/2022
CS-MW11A-LGR	1204.03	319.07	884.96	X			6/15/2022
CS-MW11B-LGR	1203.52	206.01	997.51	X			6/15/2022
CS-MW12-LGR	1259.07	291.06	968.01	X			6/15/2022
CS-MW12-BS	1258.37	285.25	973.12		X		6/15/2022
CS-MW12-CC	1257.31	305.80	951.51			X	6/15/2022
CS-MW16-LGR	1244.60	268.89	975.71	X			6/15/2022
CS-MW16-CC	1244.51	291.22	953.29			X	6/15/2022
B3-EXW01	1245.26	274.22	971.04	X			6/15/2022
B3-EXW02	1249.66	281.11	968.55	X			6/15/2022
B3-EXW03	1235.11	262.75	972.36	X			6/15/2022
B3-EXW04*	1228.46	297.49	930.97	X			6/15/2022
B3-EXW05	1279.46	307.62	971.84	X			6/15/2022
CS-MW17-LGR	1257.01	322.83	934.18	X			6/15/2022
CS-MW18-LGR	1283.61	346.96	936.65	X			6/15/2022
CS-MW19-LGR	1255.53	303.67	951.86	X			6/15/2022
CS-MW20-LGR	1209.42	257.27	952.15	X			6/15/2022
CS-MW21-LGR	1184.53	251.37	933.16	X			6/15/2022
CS-MW22-LGR	1280.49	370.15	910.34	X			6/15/2022
CS-MW23-LGR	1258.20	345.20	913.00	X			6/15/2022
CS-MW24-LGR	1253.90	276.16	977.74	X			6/15/2022
CS-MW25-LGR	1293.01	310.65	982.36	X			6/15/2022
CS-MW35-LGR	1186.97	300.35	886.62	X			6/15/2022
CS-MW36-LGR	1218.74	295.71	923.03	X			6/15/2022
CS-MW37-LGR	1205.83	312.38	893.45	X			6/15/2022
FO-20	**1327.00**	**302.86**	**1024.14**	ALL			6/15/2022
Number of wells screened in each formation.				**37**	**4**	**9**	
Average groundwater elevation in each formation given in feet (non pumping wells).				**947.99**	**961.11**	**925.89**	

Notes:
Bold wells: CS-2, CS-10, CS-12, CS-13, and FO-20 are open boreholes across more than one formational unit.
? = Exact screening information unknown for this well.
Shaded wells are routinely pumped for either domestic, livestock, or environmental remediation purposes, and therefore are not used in calculating statistics.
CS-1, CS-10, CS-12, and CS-13 are current active drinking water wells.
CS-MW16-LGR, CS-MW16-CC, B3-EXW01 through B3-EXW05 pumps are cycling continuously to feed the B-3 Bioreactor.
* = submersible pump running at time of water level measurement.
Formational average groundwater elevation is calculated from non-pumping wells screened in only one formation.
All measurements given in feet.
NA = Data not available

Table 2.2
Change in Groundwater Elevation from Previous Quarter
June 2022

Well ID	Mar. 2022 Elevations	Jun. 2022 Elevations	GW elevation change (Mar. minus Dec.)	Formations Screened LGR	Formations Screened BS	Formations Screened CC
CS-1	943.77	892.13	-51.64		ALL	
CS-2	980.57	979.62	-0.95	X	?	
CS-3	980.55	973.87	-6.68	X		
CS-10	944.51	944.43	-0.08		ALL	
CS-12	1000.68	980.14	-20.54		ALL	
CS-13	951.06	905.26	-45.80		ALL	
CS-D	982.07	976.43	-5.64	X		
CS-MWG-LGR	1019.19	1006.92	-12.27	X		
CS-MWH-LGR*	967.19	1006.96	39.77	X		
CS-I	1007.31	991.38	-15.93	X		
CS-MW1-LGR	976.36	968.15	-8.21	X		
CS-MW1-BS	987.19	971.85	-15.34		X	
CS-MW1-CC	991.04	951.73	-39.31			X
CS-MW2-LGR	978.56	966.46	-12.10	X		
CS-MW2-CC	961.63	951.66	-9.97			X
CS-MW3-LGR	983.54	976.33	-7.21	X		
CS-MW4-LGR	1002.50	970.99	-31.51	X		
CS-MW5-LGR	976.18	963.94	-12.24	X		
CS-MW6-LGR	956.83	926.85	-29.98	X		
CS-MW6-BS	962.60	913.82	-48.78		X	
CS-MW6-CC	961.26	912.91	-48.35			X
CS-MW7-LGR	950.25	917.03	-33.22	X		
CS-MW7-CC	954.11	902.84	-51.27			X
CS-MW8-LGR	957.05	920.73	-36.32	X		
CS-MW8-CC	955.92	904.83	-51.09			X
CS-MW9-LGR	991.20	984.17	-7.03	X		
CS-MW9-BS	992.15	985.63	-6.52		X	
CS-MW9-CC	995.47	950.78	-44.69			X
CS-MW10-LGR	938.35	887.73	-50.62	X		
CS-MW10-CC	933.11	880.89	-52.22			X
CS-MW11A-LGR	940.51	884.96	-55.55	X		
CS-MW11B-LGR	1003.34	997.51	-5.83	X		
CS-MW12-LGR	976.35	968.01	-8.34	X		
CS-MW12-BS	987.34	973.12	-14.22		X	
CS-MW12-CC	991.60	951.51	-40.09			X
CS-MW16-LGR	982.59	975.71	-6.88	X		
CS-MW16-CC	991.06	953.29	-37.77			X
B3-EXW01	979.84	971.04	-8.80	X		
B3-EXW02	979.01	968.55	-10.46	X		
B3-EXW03	975.24	972.36	-2.88	X		
B3-EXW04*	920.86	930.97	10.11	X		
B3-EXW05	980.90	971.84	-9.06	X		
CS-MW17-LGR	952.13	934.18	-17.95	X		
CS-MW18-LGR	946.77	936.65	-10.12	X		
CS-MW19-LGR	962.09	951.86	-10.23	X		
CS-MW20-LGR	966.74	952.15	-14.59	X		
CS-MW21-LGR	952.42	933.16	-19.26	X		
CS-MW22-LGR	947.61	910.34	-37.27	X		
CS-MW23-LGR	945.48	913.00	-32.48	X		
CS-MW24-LGR	982.70	977.74	-4.96	X		
CS-MW25-LGR	988.61	982.36	-6.25	X		
CS-MW35-LGR	938.56	886.62	-51.94	X		
CS-MW36-LGR	957.44	923.03	-34.41	X		
CS-MW37-LGR	948.88	893.45	-55.43	X		
FO-20	**1045.30**	**1024.14**	-21.16		ALL	
Average groundwater elevation change (all wells minus pumping wells)			**-24.31**			
Average groundwater elevation change in each formation (non pumping wells)				**-20.43**	**-21.22**	**-42.12**

Notes:
Bold wells: CS-2, CS-10, CS-12, CS-13, and FO-20 are open boreholes across more than one formational unit.
? = Exact screening information unknown for this well.
Shaded wells are routinely pumped for either domestic, livestock, or environmental remediation purposes, and therefore are not used in calculating statistics.
CS-1, CS-10, CS-12, and CS-13 are current active drinking water wells.
CS-MW16-LGR, CS-MW16-CC, B3-EXW01 through B3-EXW05 pumps are cycling continuously to feed the B-3 Bioreactor.
* = submersible pump running at time of water level measurement.
Formational average groundwater elevation change is calculated from non-pumping wells screened in only one formation.
All measurements given in feet.
NA = Data not available



N

0 0.5 Miles

Flow direction

Outer fence

LGR Groundwater Contours

LGR Wells and groundwater elevation (ft above msl)

Drinking water wells (may be completed in LGR, BS, and/or CC)

* Not a fully penetrating well into LGR. Groundwater elevation not used in contouring

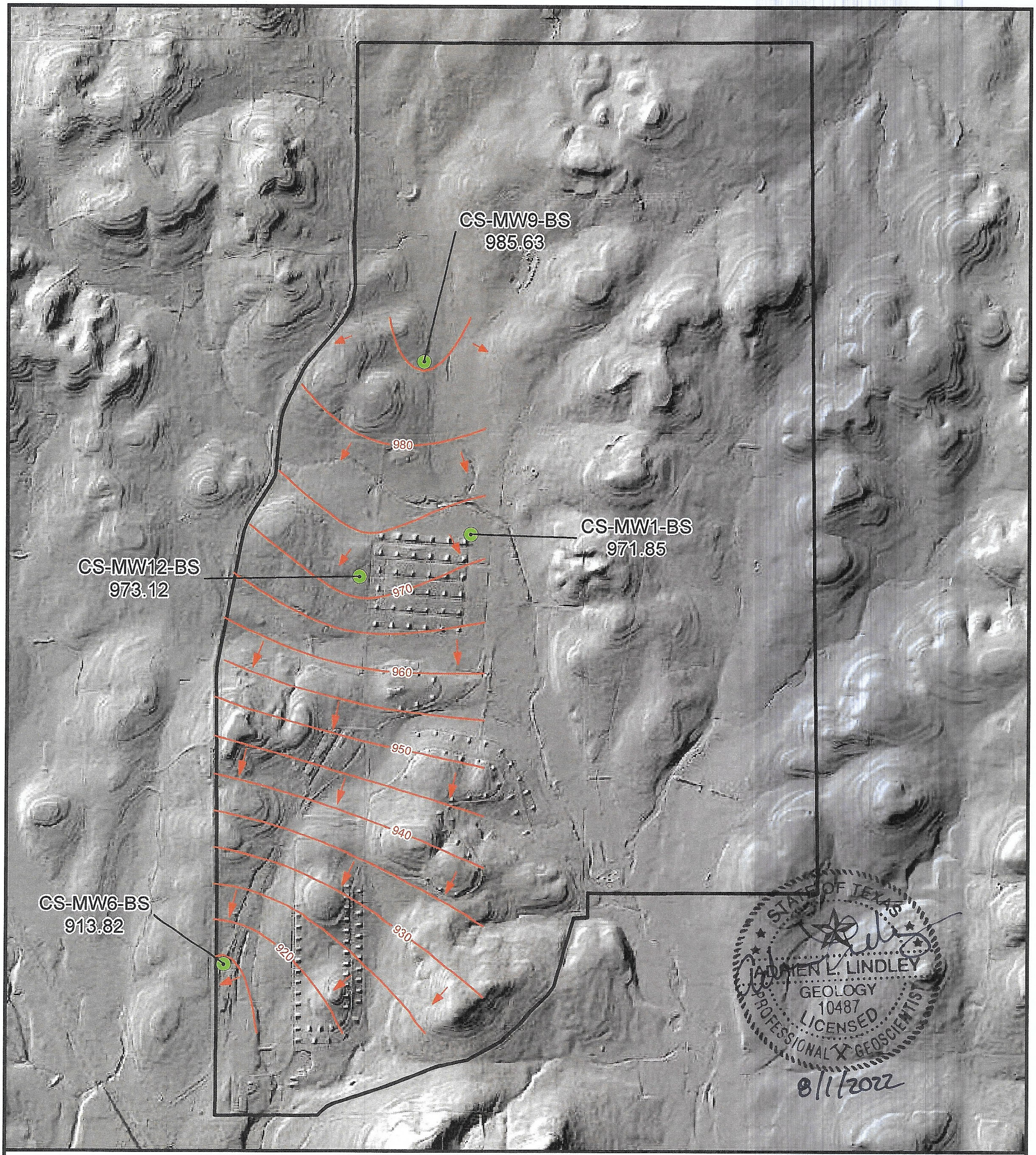
C:\CSSA\GIS\GW_POTENTIOMETRIC\JUN2022\Jun22_potentiometric_lgr.mxd - 7/6/2022 @ 6:56:11 PM

Figure 2.1

June 2022 Potentiometric Surface Map, LGR Wells

Camp Stanley Storage Activity

PARSONS



N

0 0.5 Miles

Flow direction

Outer fence

BS Groundwater Contours

BS Wells and groundwater elevation (ft above msl)

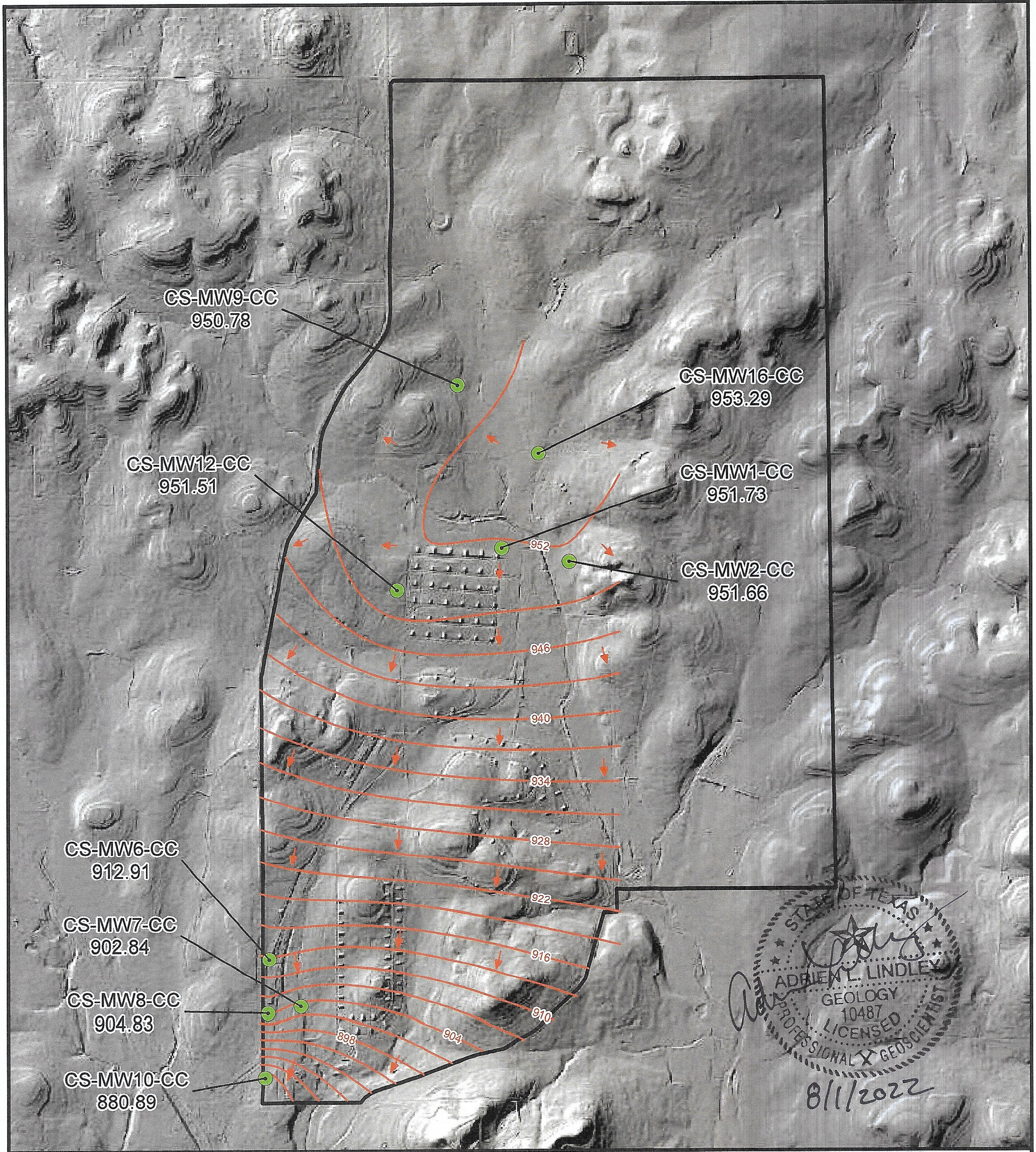
Figure 2.2

June 2022 Potentiometric Surface Map, BS Wells

Camp Stanley Storage Activity

PARSONS

C:\CSSA\GIS\GW_POTENTIOMETRIC\JUN2022\Jun22_potentiometric_bs.mxd - 7/6/2022 @ 7:41:25 PM



N

0 0.5 Miles

Flow direction
Outer fence
CC Groundwater Contours
CC Wells and groundwater elevation (ft above msl)

C:\CSSA\GIS\GW_POTENTIOMETRIC\JUN2022\Jun22_potentiometric_cc.mxd - 7/6/2022 @ 7:21:25 PM

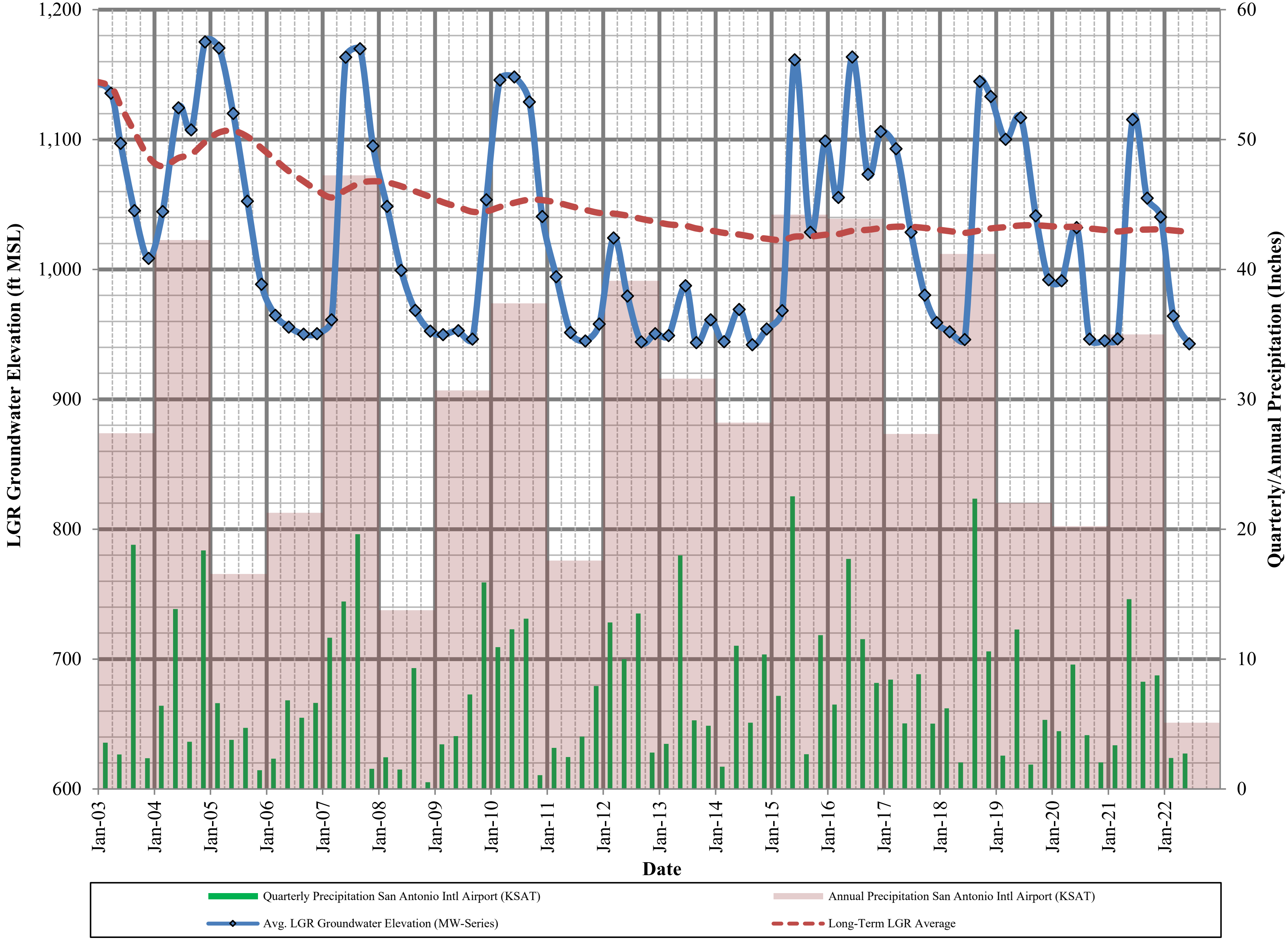
Figure 2.3

June 2022 Potentiometric Surface Map, CC Wells

Camp Stanley Storage Activity

PARSONS

Figure 2.4 - Average LGR Groundwater Elevations and Quarterly/Annual Precipitation



J:\CSSA Program\Restoration\Groundwater\Surfer GW Files\Cumulative GW Map Elevations4.xlsx AVG LGR Chart

It should be noted that well pumping on and around CSSA affects the potentiometric surface. On-post wells CS-MW16-LGR, CS-MW16-CC, B3-EXW01, B3-EXW02, B3-EXW03, B3-EXW04, and B3-EXW05 are cyclically pumped as part of the Bioreactor remediation system at Solid Waste Management Unit (SWMU) B-3. These remediation wells provide groundwater to the Bioreactor system and are automatically operated based upon water level within each well and availability within the storage tanks. Influences from the pumping of the Bioreactor extraction wells may be manifested as "cones of depression". The Bioreactor cone of depression is induced into the aquifer to extract contaminated water within its direct zone of influence, and otherwise retard the flow of the groundwater that cannot be directly captured by the extraction wells away from the site. The typical "cone of depression" is observed in the June 2022 LGR potentiometric surface map.

CSSA drinking water wells CS-1, CS-10, CS-12, and CS-13 are also cycled on and off to maintain the drinking water system currently in place at CSSA and, as a result, may manifest a cone of depression. Additionally, off-post water supply wells along Ralph Fair Road may also exert a subtle influence on gradients along the western and southern boundaries of the post. In June, no cones of depression or other subtle influences derived from pumping on-post drinking water wells or off-post water supply wells are observed.

Historical groundwater monitoring at CSSA has demonstrated that the aquifer gradient typically slopes in a south-southeast direction; however, variable aquifer levels and well-pumping scenarios can affect the localized and regional gradients (**Figure 2.1**). Below average precipitation recorded during the quarter has resulted in a decrease in water levels since March 2022. The typical south-southeasterly gradient is observed across the post in June 2022, interrupted only by the cone of depression centered on the bioreactor and slight mound at CS-MW4-LGR in the central portion of the post.

Pumping action at wells CS-1, CS-10, CS-12, CS-13, CS-MW16-LGR/CC, B3-EXW01 through B3-EXW05, CS-MWH-LGR, CS-I, and even off-post wells (Fair Oaks Ranch) can significantly alter the LGR groundwater gradient. The overall groundwater gradient across CSSA is typically measured from CS-MWH-LGR to CS-1. In June, the calculated gradient from well CS-MWH-LGR to CS-1 was 0.007177 ft/ft indicating a south-southeasterly flow and represents a more steeply dipping water table compared to the gradient calculated in March (0.005706 ft/ft from well FO-20 to CS-1).

Under normal conditions, the potentiometric surface in both the BS and CC members of the aquifer generally trend in a southerly direction, similar to the LGR, but during periods of above-average water levels or intense aquifer recharge, an eastward component in both the BS and CC may develop. In June 2022, the average groundwater elevation of the BS was 961.11 feet MSL, a decrease of 21.21 feet since March; and groundwater flow was to the south-southwest across the post (**Figure 2.2**).

A review of historical data has shown that the CC potentiometric surface develops a predominantly easterly gradient when the average CC groundwater elevation is higher than 995 feet MSL. Below 995 feet MSL, the gradient resumes a more southerly flow direction. In June 2022, the average groundwater elevation for all non-pumping CC wells was 928.94 feet MSL, a decrease of 40.5 feet since March; and a mostly southerly gradient is evident (**Figure 2.3**). A slight perturbation is observed in the northern portion of the post where the recorded water level for well CS-MW9-CC is slightly lower than well CS-MW16-CC to the south and east. This may be associated with mounding associated with bioreactor operations within the LGR, which subsequently impacts the BS and CC water levels locally.

Groundwater elevations have been measured and recorded since 1992. Previous droughts resulted in water levels decreasing substantially in 1996, 1999, 2000, 2006, 2008, 2009, 2011 through 2014 and from June 2017 to August 2018. In September 2018, historic rainfalls and above-average rains in the fourth quarter contributed to an average LGR groundwater elevation of 1,133.18 feet MSL by December (101.62 feet above the then 16-year long-term average). Below average rainfall in the third and fourth quarters of 2019 resulted in a 124.76-foot decline in water level elevation from June to December. Continuing that trend through September 2020, the below average precipitation received resulted in an additional 47-foot decline in the water level elevation since December 2019. From September 2020 through March 2021, below average precipitation persisted, resulting in a less than 2-foot fluctuation in the average LGR groundwater elevation. Above average rain in March resulted in a significant increase in water levels and an end to drought conditions, however average rains through the remainder of 2021 could not maintain the above average water levels within the aquifer. With well below average precipitation recorded during first and second quarters of 2022, the water level within the LGR has fallen 97.66 feet since December 2021 to 942.79 feet MSL, which is 86.09 feet below the long-term average of 1028.88 feet (now at 19.75 years).

It is worth noting that, based on more than 19 years of program history, the post wide LGR groundwater level has declined by 116.46 feet (see **Figure 2.4**). As can be expected with sparse data sets, the largest rate of change/decline (90 feet) came during the initial 4 years of the groundwater monitoring program. Over the past 10 years, the average decline rate has subdued, with only a 10.05-foot difference in average water groundwater elevation. This 10-year period included 25 quarters with below average groundwater elevations and 15 quarters of above average groundwater elevations. Over the course of the 19.75-year history of CSSA groundwater monitoring, the aquifer level is "below average" approximately 63.3 percent of the time. Over the last three years (12 monitoring events), the aquifer has been "below average" 66.6 percent of the time.

3.0 JUNE ANALYTICAL RESULTS

3.1 Monitoring Wells

Under the provisions of the groundwater monitoring DQOs and the 2020 LTMO evaluation, the schedule for sampling on-post in June 2022 included 4 wells. All four wells were sampled in June. In conjunction with the off-post monitoring initiative (under a separate report) the June 2022 groundwater sampling constituted a “quarterly” event as outlined in the 2020 LTMO schedule, which was implemented in December 2020.

Additional samples were collected as part of the SWMU B-3 bioreactor Corrective Measures operations; these results will be documented in separate reports. **Tables 3.1** and **3.2** provide a sampling overview for June 2022 and the schedule under the LTMO recommendations. The wells listed in **Table 3.1** are sampled using dedicated low-flow gas-operated bladder pumps. Wells CS-1, CS-10, CS-12, and CS-13 were sampled using dedicated electric submersible pumps. **Figure 3.1** shows well sampling locations.

All wells sampled were purged until the field parameters of pH, temperature, and conductivity stabilized. The on-post wells were sampled in June 2022 for volatile organic compounds (VOCs) analytes which include *cis*-1,2-dichloroethene (*cis*-1,2-DCE), tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride. Metals analyses is included in active groundwater remediation sites (AOC-65 and B-3), as well as on-post drinking water wells. As such, active drinking water wells CS-1, CS-10, CS-12, and CS-13 were analyzed for the same VOC analytes and metals (arsenic, barium, chromium, copper, zinc, cadmium, mercury, and lead).

Samples were analyzed by Eurofins TestAmerica (ETA) in Arvada, Colorado. All detected concentrations of VOCs and metals are presented in **Table 3.3**. Full analytical results are presented in **Appendix B**.

No wells sampled this quarter had VOCs detected above the applicable Maximum Contaminant Levels (MCL). A comparison of VOC concentrations versus water level for select wells is presented in **Figure 3.2**. The overall trend for CS-MW1-LGR and CS-MW5-LGR last sampled in March 2022 was a slight increase in VOC concentrations with a significant decrease in groundwater elevation. Wells CS-MW36-LGR and CS-3 showed a decrease in VOC concentrations as well as a decrease in groundwater elevation. CS-MW5-LGR has been sampled since 2001, but it did not show concentrations of PCE and TCE above the MCL until December 2015. PCE and TCE remained above the MCL through 2017 then dropped back below in 2018. TCE was detected above the MCL again in December 2019. In December 2020 and March 2022 no VOC were above the MCL in well CS-MW5-LGR. This quarter the overall groundwater elevation in all wells indicates a slight drop in elevation following the significant drop from December 2021. Wells presented in **Figure 3.2** are sampled every 15 months according to the current LTMO, with the next scheduled event occurring in June 2023. Also, well CS-D was not sampled in March 2022 due to the water level falling below the well pump.

Table 3-2
Overview of Westbay Sampling for June 2022

Westbay Interval	Last Sample Date	Jun-21	Sep-21	Dec-21	Mar-22 (30 month)	Jun-22	LTMO Sampling Frequency (as of Dec. 2020)
CS-WB01-UGR-01	Sep-18	NS	NS	NS	NSWL	NS	15 months
CS-WB01-LGR-01	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-02	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-03	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-04	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-05	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-06	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-07	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-08	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB01-LGR-09	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB02-UGR-01	Dec-04	NS	NS	NS	NS	NS	port clogged
CS-WB02-LGR-01	Sep-18	NS	NS	NS	NSWL	NS	15 months
CS-WB02-LGR-02	Sep-18	NS	NS	NS	NSWL	NS	15 months
CS-WB02-LGR-03	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB02-LGR-04	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB02-LGR-05	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB02-LGR-06	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB02-LGR-07	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB02-LGR-08	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB02-LGR-09	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-UGR-01	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-LGR-01	Dec-19	NS	NS	NS	NSWL	NS	15 months
CS-WB03-LGR-02	Jun-16	NS	NS	NS	NSWL	NS	15 months
CS-WB03-LGR-03	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-LGR-04	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-LGR-05	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-LGR-06	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-LGR-07	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-LGR-08	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB03-LGR-09	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-UGR-01	Nov-04	NS	NS	NS	NSWL	NS	15 months
CS-WB04-LGR-01	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-LGR-02	Mar-10	NS	NS	NS	NSWL	NS	30 months
CS-WB04-LGR-03	Mar-22	NS	NS	NS	S	NS	30 months
CS-WB04-LGR-04	Mar-22	NS	NS	NS	S	NS	30 months
CS-WB04-LGR-06	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-LGR-07	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-LGR-08	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-LGR-09	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-LGR-10	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-LGR-11	Mar-22	NS	NS	NS	S	S	15 months
CS-WB04-BS-01	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-BS-02	Mar-22	NS	NS	NS	S	NS	15 months
CS-WB04-CC-01	Mar-22	NS	NS	NS	S	S	15 months
CS-WB04-CC-02	Mar-22	NS	NS	NS	S	S	15 months
CS-WB04-CC-03	Mar-22	NS	NS	NS	S	S	15 months

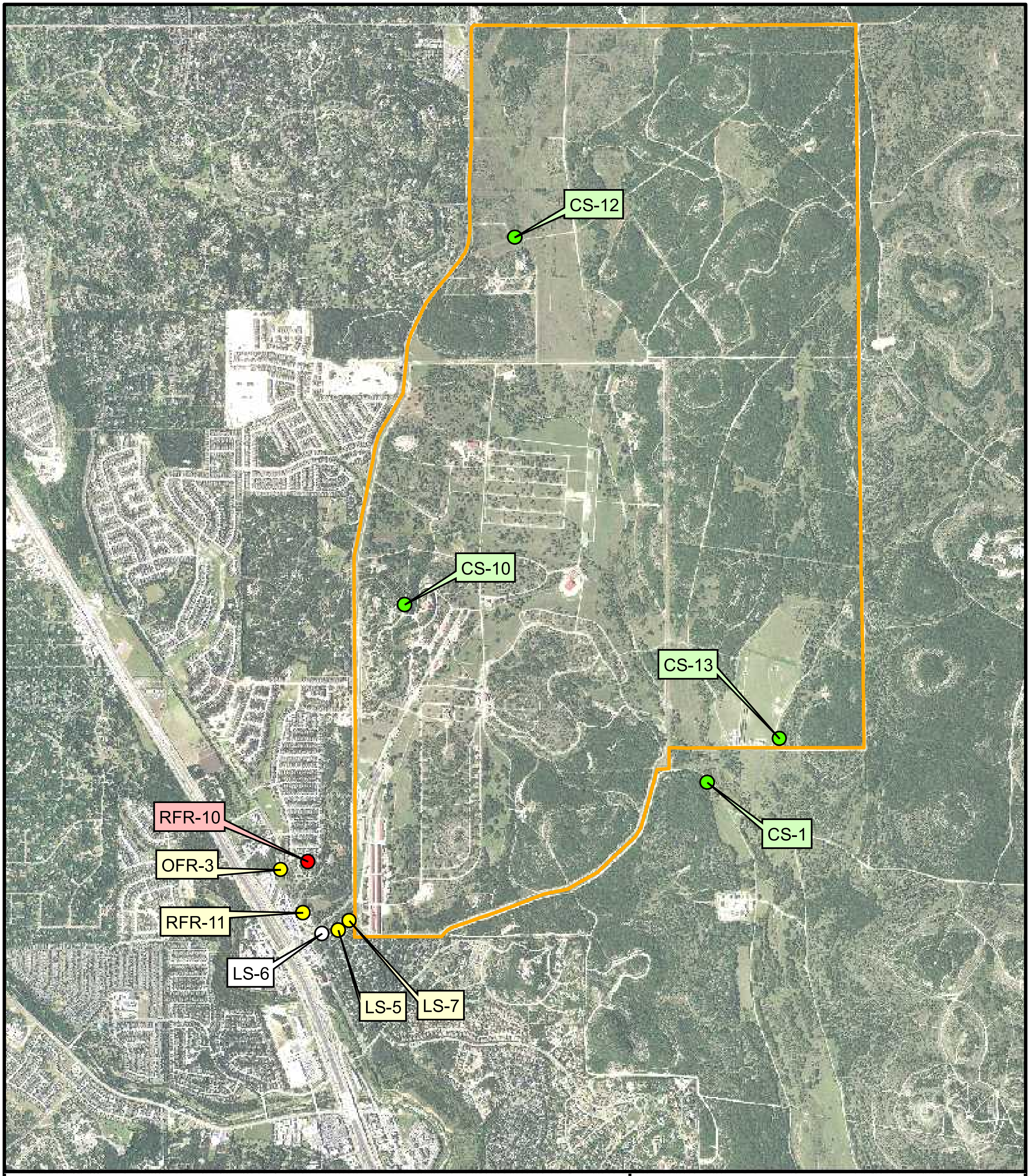
Profiling performed quarterly, in conjunction with post wide water levels.
S = sample
NS = no sample
NSWL = no sample due to dry port.

Table 3-1
Overview of On-Post Sampling for June 2022

Count	Well ID	*Analytes*	*Last Sample Date*	*Sep-21*	*Dec-21*	*Mar-22 (30 month)*	*Jun-22*	*LTMO Sampling Frequency**
	CS-MW1-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW1-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW1-CC	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW2-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW2-CC	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW3-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW4-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW5-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW6-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW6-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW6-CC	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW7-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW7-CC	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW8-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW8-CC	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW9-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW9-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW9-CC	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW10-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW10-CC	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW11A-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW11B-LGR	VOCs	Sep-18	NS	NS	NSWL	NS	15 months
	CS-MW12-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW12-BS	VOCs	Dec-12	NS	NS	NS	NS	as needed
	CS-MW12-CC	VOCs	Mar-22	NS	NS	S	NS	30 months
	CW-MW17-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW18-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW19-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
1	CS-1	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Mar-22	S	S	S	S	Quarterly
	CS-2	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-3	VOCs	Mar-22	NS	NS	S	NS	15 months
2	CS-10	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Mar-22	S	S	S	S	Quarterly
3	CS-12	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Mar-22	S	S	S	S	Quarterly
4	CS-13	VOCs & metals (As,Ba,Cr, Cu,Cd,Hg,Pb,Zn)	Mar-22	S	S	S	S	Quarterly
	CS-D	VOCs	Dec-19	NS	NS	NSWL	NS	15 months
	CS-MWG-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MWH-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-I	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW20-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW21-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW22-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW23-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW24-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW25-LGR	VOCs	Mar-22	NS	NS	S	NS	30 months
	CS-MW35-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW36-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months
	CS-MW37-LGR	VOCs	Mar-22	NS	NS	S	NS	15 months

Notes/Abrreviations:
* New LTMO sampling frequency implemented December 2020.
S = Sample
NS = No Sample
NSWL = no sample due to water level falling below dedicated pump.

J:\CSSA Program\Restoration\Groundwater\GW Monitoring Reports\2022\June



N
W E
S

0 0.25 0.5
Miles

Sampled Wells June 2022

- > MCL (VOC's) only
- > LOQ (VOC's) only
- > DL (VOC's) only
- ND

C:\CSSA\GIS\MXD\GW_QUARTERLY\Jun22_Sampled_Wells_fig2_color-coded_labels.mxd 7/7/2022 9:37:56 AM wayne.simoneau@parsons.com

Figure 3-1

On-Post and Off-Post Well Sampling Locations for June 2022

Camp Stanley Storage Activity

PARSONS

Table 3-3
June 2022 On-Post Quarterly Groundwater Results, Detected Analytes

Well ID	Sample Date	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Zinc	Mercury
CSSA Drinking Water Well System									
CS-1	6/2/2022	--	**0.0379**	--	--	**0.00687F**	--	**0.0537**	--
CS-10	6/2/2022	--	**0.0408**	--	--	--	--	**0.0928**	--
CS-10 FD	6/2/2022	--	**0.0406**	--	--	--	--	**0.0926**	--
CS-12	6/2/2022	--	**0.0326**	--	--	--	**0.00316F**	**0.240**	--
CS-13	6/2/2022	--	**0.0301**	--	--	**0.0130F**	--	**0.196**	--
Comparison Criteria									
Detection Limit (DL)		0.00441	0.000820	0.000130	0.000660	0.00420	0.00274	0.00149	0.0000610
Limit of Quantitation (LOQ)		0.0150	0.0100	0.00500	0.0100	0.0150	0.00900	0.0200	0.000200
Max. Contaminant Level (MCL)		0.01	2	0.005	0.1	AL=1.3	AL=0.015	SS=5.0	0.002

Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
CSSA Drinking Water Well System					
CS-1	6/2/2022	--	--	--	--
CS-10	6/2/2022	--	--	--	--
CS-10 FD	6/2/2022	--	--	--	--
CS-12	6/2/2022	--	--	--	--
CS-13	6/2/2022	--	--	--	--
Comparison Criteria					
Detection Limit (DL)		0.150	0.200	0.160	0.100
Limit of Quantitation (LOQ)		1.00	1.00	1.00	1.50
Max. Contaminant Level (MCL)		70	5	5	2

BOLD	= Above the DL
BOLD	= Above the LOQ
BOLD	= Above the MCL

Precipitation per Quarter:	Mar-22	22-Jun
AOC-65 Weather Station (AOC-65 WS):	1.52	3.74
MW18 Weather Station (MW18 WS):	1.97	5.1

All samples were analyzed by Eurofins TestAmerica
VOC data reported in ug/L & metals data reported in mg/L.

Abbreviations/Notes:

FD	Field Duplicate
TCE	Trichloroethene
PCE	Tetrachloroethene
DCE	Dichloroethene
AL	Action Level
SS	Secondary Standard
NA	Not Analyzed for this parameter

Data Qualifiers
--The analyte was analyzed for, but not detected. The associated numerical value is at or below the DL.
F-The analyte was positively identified but the associated numerical value is below the LOQ.

Table 3.4
June 2022 Westbay Analytical Results, Detected Analytes

Well ID	Date Sampled	cis-1,2-DCE (cis-1,2-dichloroethene)	TCE (trichloroethene)	PCE (tetrachloroethene)	Vinyl Chloride
CS-WB04-LGR-11	6/22/2022	--	--	**0.845J**	--
CS-WB04-CC-01	6/22/2022	**1.32**	--	--	--
CS-WB04-CC-02	6/22/2022	--	--	--	--
CS-WB04-CC-03	6/22/2022	--	--	--	--
Comparison Criteria					
Detection Limit	**DL**	**0.321**	**0.300**	**0.403**	**0.505**
Limit of Quantitation	**LOQ**	**1.00**	**1.00**	**1.00**	**1.50**
Max. Contaminant Level	**MCL**	**70**	**5**	**5**	**2**

Data Qualifiers

'--' indicates the result was non-detect.

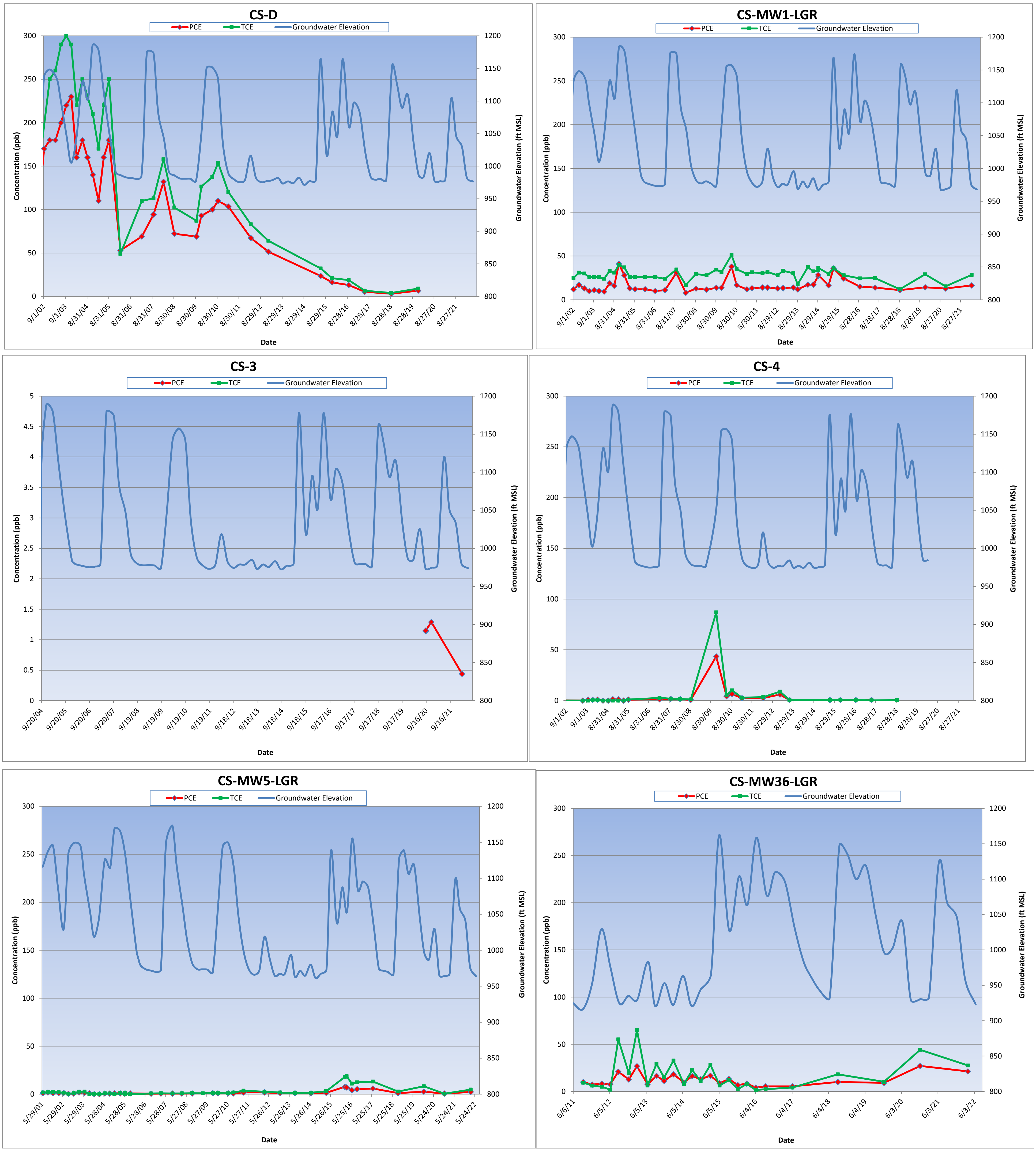
J-The analyte was positively identified; the quantitation is an estimation.

Q-One or more quality control criteria failed.

All values are reported in µg/L.

BOLD	≥ DL
BOLD	≥ LOQ
BOLD	≥ MCL

Figure 3.2
On-Post Cumulative Analytical vs. Groundwater Elevation



NOTE: Sampling dates are indicated by the squares on the trend line.

Results from on-post monitoring wells are considered definitive data and are subject to data validation and verification under provisions of the CSSA Quality Assurance Project Plan (QAPP). Parsons data package numbered 280-162982 containing the analytical results from this sampling event, were received by Parsons June 16, 2022. Data validation was conducted, and data validation reports are presented in **Appendix C**.

3.2 Westbay-equipped Wells

The latest updated LTMO schedule was implemented in December 2020. In June 2022, no Westbay Well zones were scheduled for sampling. However, 4 zones (-LGR-11, -CC-01, -CC-02, and CC-03) from WB04 were added to the sampling schedule due to increasing VOC concentrations reported in March. These wells (CS-WB01, CS-WB02, CS-WB03, and CS-WB04) were also profiled to capture water level data. These Westbay wells are located in the vicinity of AOC-65 and are part of the post-wide quarterly groundwater monitoring program. Per the approved 2020 LTMO, the Upper Glen Rose (UGR)/LGR/BS/CC zones are to be sampled on a 15-month schedule. Select LGR zones from WB04 are sampled on a 30-month schedule. The sampling of these wells began in September 2003.

There are four other Westbay wells (CS-WB05, CS-WB06, CS-WB07, and CS-WB08) that are located at the SWMU B-3 remediation site. Those wells are sampled on a separate schedule in association with the SWMU B-3 bioreactor monitoring. Results for those wells are presented in the SWMU B-3 Performance Status Reports.

4.0 JUNE 2022 SUMMARY

- Groundwater samples were collected from 4 on-post wells scheduled for monitoring in June 2022. An additional 4 Westbay® samples were collected as part of this sampling event.
- From April 1st through June 30th, 2022, CSSA's AOC-65 weather stations recorded 3.74 inches of rainfall and the MW18 weather station recorded 5.1 inches. Most of the rainfall this quarter fell in June. The AOC-65 and MW18 WSs recorded 0.39/0.52 inches in April, 1.52/1.82 inches in May, and 1.83/2.76 inches in June. One event (June 28th) had greater than one inch of daily rainfall during this period.
- The Middle Trinity aquifer levels (LGR, BS, and CC) decreased an average of 24.31 feet per non-pumping well since last quarter. The average water level in June (excluding pumping wells) was 295.38 feet BTOC (949.43 feet MSL).
- VOCs were not detected above the MCL in wells sampled in June 2022. (**Table 3.3**).
- There were no metals detected above the MCL/AL/SS in the wells sampled in June 2022.
- Four Westbay® intervals were added to the sampling schedule in June. In March all four zones had detections of PCE with zone CS-WB04-CC-03 above the MCL. In June, only zone CS-WB04-LGR-11 has a trace detection of PCE. Zone CS-WB04-CC-01 showed *cis*-1,2-DCE above the LOQ which is consistent with the March results. These zones will be sampled quarterly for one year to determine new trends or plume movement in the area. The remaining intervals should remain on the 15- and 30-month sampling schedules in the future as recommended in the LTMO study.
- The 2020 update to the LTMO and DQOs was approved by the EPA and TCEQ in September 2020, see **Appendix D**. These updated schedules were implemented in December 2020.

APPENDIX A

EVALUATION OF DATA QUALITY OBJECTIVES ATTAINMENT

Appendix A Evaluation of Data Quality Objectives Attainment

Activity	Objectives	Action	Objective Attained?	Recommendations
Field Sampling	Conduct field sampling in accordance with procedures defined in the project work plan, SAP, QAPP, PSHEP, and LTMO recommendations.	All sampling was conducted in accordance with the procedures described in the project plans.	Yes.	NA
Characterization of Environmental Setting (Hydrogeology)	Prepare water-level contour and/or potentiometric maps for each formation of the Middle Trinity Aquifer (3.5.3).	Potentiometric surface maps were prepared based on water levels measured in each of CSSA's wells screened in three formations on June 15, 2022.	To the extent possible with data available. Due to the limited data available and the fact that wells are completed across multiple water-bearing units, potentiometric maps should only be used for regional water flow direction, not local. Ongoing pumping in the CSSA area likely affects the natural groundwater flow direction.	As additional wells are installed screened in distinct formations, future evaluations will eliminate reliance on wells screened across multiple formations.
	Describe the flow system, including the vertical and horizontal components of flow (2.1.9).	Potentiometric maps were created using June 15, 2022, water level data, and horizontal flow direction was tentatively identified. Insufficient data are currently available to determine vertical component of flow.	As described above, due to the lack of aquifer-specific water level information, potentiometric surface maps should only be used as an estimate of regional flow direction.	Same as above.
	Define formation(s) in the Middle Trinity Aquifer are impacted by the VOC contaminants (2.1.3).	Quarterly groundwater monitoring provides information on Middle Trinity Aquifer impacts. Monitoring wells equipped with Westbay® - multi-port samplers are sampled every 15 or 30 months.	Yes.	Continue sampling.

Activity	Objectives	Action	Objective Attained?	Recommendations
Characterization of Environmental Setting (Hydrogeology) (Continued)	Identify any temporal changes in hydraulic gradients due to seasonal influences (2.1.5).	Downloaded data from continuous-reading transducers in wells: CS-MW4-LGR, CS-MW12-LGR, CS-MW12-CC, CS-MW8-CC. CS-MW10-LGR, and CS-MW10-CC. Additional continuous reading transducers were added to the program through the SCADA project. The following wells can be uploaded to see real time water level data: CS-MW16-LGR, CS-MW16-CC, CS-1, CS-12, CS-13, and CS-10. Data was also downloaded from the AOC-65, MW18, and B-3 weather stations. Water levels will be graphed at these wells against precipitation data through December 2022 and included in the annual groundwater report.	Yes.	Continue collection of transducer data and possibly install transducers in other cluster wells.
Contamination Characterization (Ground Water Contamination)	Characterize the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility (3.1.2).	Samples for laboratory analysis were collected from 4 of 43 CSSA wells. The 4 BS wells are sampled on an 'as needed' basis as part of the groundwater program.	The horizontal and vertical extent of groundwater contamination is continuously monitored.	Continue groundwater monitoring and construct additional wells as necessary.
	Determine the horizontal and vertical concentration profiles of all constituents of concern (COC) in the groundwater that are measured by USEPA-approved procedures (3.1.2). COCs are those chemicals that have been detected in groundwater in the past and their daughter (breakdown) products.	Groundwater samples were collected from wells: CS-1, CS-10, CS-12, and CS-13. Samples were analyzed for the short list of VOCs using USEPA method SW8260C. The drinking water wells were also sampled for metals (arsenic, barium, chromium, copper, cadmium, mercury, lead, and zinc). Analyses were conducted in accordance with the CSSA QAPP and approved variances. All reporting limits (RL) were below MCLs, as listed below:	Yes.	Continue sampling.

Activity	Objectives	Action	Objective Attained?	Recommendations
Contamination Characterization (Ground Water Contamination) (Continued)	Determine the horizontal and vertical concentration profiles of all constituents of concern (COC) in the groundwater that are measured by USEPA-approved procedures (3.1.2). COCs are those chemicals that have been detected in groundwater in the past and their daughter (breakdown) products.	**ANALYTE** / **LOQ (µg /L)** / **MCL(µg/L)** *cis*-1,2-DCE 1.0 70 PCE 1.0 5 TCE 1.0 5 Vinyl chloride 1.5 2	Yes.	Continue sampling.
		ANALYTE / **LOQ (µg/L)** / **MCL/AL (µg /L)** Barium 10 2,000 Chromium 15 100 Copper 15 1,300 Zinc 150 5,000 Arsenic 25 10 Cadmium 5 5 Lead 15 15 Mercury 0.2 2	Yes.	Continue sampling.
	Meet CSSA QAPP quality assurance requirements.	Samples were analyzed in accordance with the CSSA QAPP and approved variances. Parsons chemists verified all data.	Yes.	NA
		All data flagged with a "U," "J," "M," and "Q" are usable for characterizing contamination. All "R" flagged data are considered unusable.	Yes.	NA

Activity	Objectives	Action	Objective Attained?	Recommendations
Contamination Characterization (Ground Water Contamination) (Continued)	Meet CSSA QAPP quality assurance requirements. (Continued)	Previously, a method detection limit (MDL) study for arsenic, cadmium, and lead was not performed within a year of the analyses, as required by the AFCEE QAPP.	The laboratory performed new MDL studies in February 2001 for these metals and the new MDL values were found to be almost identical to the previous MDLs and all met the associated AFCEE QAPP requirements. MDLs for these three metals are well below MCLs. In addition, the laboratory performed daily calibrations and RL verifications for these metals, both of which demonstrate the laboratory's ability to detect and quantitate these metals at RL levels. These daily analyses also indicate that concentrations above the laboratory RL for these compounds were not affected by the expired MDL study.	Use results for groundwater characterization purposes.
Remediation	Determine goals and create cost-effective and technologically appropriate methods for remediation (2.2.1).	Continued data collection will provide analytical results for accomplishing this objective.	Ongoing.	Continue sampling and evaluation, including quarterly groundwater monitoring teleconferences to address remediation.
	Determine placement of new wells for monitoring (2.3.1, 3.6)	Sampling frequency and sample locations to be monitored (including any new wells) will be based on trend data from monitoring event(s) (3.1.5).	Ongoing.	Continue quarterly groundwater teleconferences to discuss sampling frequency and placement of new monitor wells.
Project schedule/ Reporting	Produce a quarterly monitoring project schedule as a road map for sampling, analysis, validation, verification, reviews, and reports.	Prepare schedules and sampling guidelines prior to each quarterly sampling event.	Yes.	Continue sampling schedule preparation each quarter.

APPENDIX B

QUARTERLY ON-POST GROUNDWATER MONITORING ANALYTICAL RESULTS JUNE 2022

Appendix B
Quarterly On-Post Groundwater Monitoring Analytical Results, June 2022

Well ID	Sample Date	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Zinc	Mercury
CSSA Drinking Water Well System									
CS-1	6/2/2022	0.00441U	**0.0379**	0.000130U	0.000660U	**0.00687F**	0.00274U	**0.0537**	0.0000610U
CS-10	6/2/2022	0.00441U	**0.0408**	0.000130U	0.000660U	0.00420U	0.00274U	**0.0928**	0.0000610U
CS-10 FD	6/2/2022	0.00441U	**0.0406**	0.000130U	0.000660U	0.00420U	0.00274U	**0.0926**	0.0000610U
CS-12	6/2/2022	0.00441U	**0.0326**	0.000130U	0.000660U	0.00420U	**0.00316F**	**0.240**	0.0000610U
CS-13	6/2/2022	0.00441U	**0.0301**	0.000130U	0.000660U	**0.0130F**	0.00274U	**0.196**	0.0000610U

Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
CSSA Drinking Water Well System					
CS-1	6/2/2022	0.150U	0.200U	0.160U	0.100U
CS-10	6/2/2022	0.150U	0.200U	0.160U	0.100U
CS-10 FD	6/2/2022	0.150U	0.200U	0.160U	0.100U
CS-12	6/2/2022	0.150U	0.200U	0.160U	0.100U
CS-13	6/2/2022	0.150U	0.200U	0.160U	0.100U

BOLD	= Above the DL
BOLD (blue shading)	= Above the LOQ
BOLD (red shading)	= Above the MCL

All samples were analyzed by Eurofins TestAmerica
VOC data reported in ug/L & metals data reported in mg/L.

Abbreviations/Notes:

FD	Field Duplicate
TCE	Trichloroethene
PCE	Tetrachloroethene
DCE	Dichloroethene
AL	Action Level
SS	Secondary Standard
NA	Not Analyzed for this parameter

Data Qualifiers

U-The analyte was analyzed for, but not detected. The associated numerical value is at or below the DL.
F-The analyte was positively identified but the associated numerical value is below the LOQ.

APPENDIX C

DATA VALIDATION REPORT
280-162982
280-162401

DATA VERIFICATION SUMMARY REPORT

for groundwater samples collected from

CAMP STANLEY STORAGE ACTIVITY

BOERNE, TEXAS

Data Verification by: Sandra de las Fuentes
Parsons - Austin

INTRODUCTION

The following data verification summary report covers eleven groundwater samples collected from Camp Stanley Storage Activity (CSSA) June 2, 2022. The samples were assigned to the following Work Order (WO).

280-162982

The field QC sample associated with this WO was one trip blank (TB), one matrix spike/matrix spike duplicate (MS/MSD) set, and one field duplicate (FD). No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary, due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by Eurofins TestAmerica in Denver, Colorado (ETA) following the procedures outlined in the DRAFT CSSA QAPP (pending approval, Parsons 2022) and in PO #0012175. Samples in this WO were shipped to the laboratory in two coolers, which were received by the laboratory at acceptable temperatures of 1.2ºC and 1.8ºC.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Lab ID	Matrix	VOCs	Metals	Mercury	Comments
TB-1	280-162982-1	Water	X			
LS-7	280-162982-2	Water	X			
LS-5	280-162982-3	Water	X			
OFR-3	280-162982-4	Water	X			
RFR-10	280-162982-5	Water	X			
RFR-11	280-162982-6	Water	X			
LS-6	280-162982-7	Water	X			
CS-1	280-162982-8	Water	X	X	X	
CS-13	280-162982-9	Water	X	X	X	MS/MSD
CS-12	280-162982-10	Water	X	X	X	
CS-10	280-162982-11	Water	X	X	X	
CS-10_FD	280-162982-12	Water	X	X	X	FD of CS-10

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
VOCs	Water	SW5030B	SW8260C	µg/L
Metals	Water	SW3010A	SW6010C	mg/L
Mercury	Water	SW7470A	SW7470A	mg/L

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in in the DRAFT CSSA QAPP (Parsons 2022) and in PO #0012175. The control limits used to evaluate the surrogates, laboratory control samples (LCSs), and MS/MSDs are also referenced in the DoD QSM, version 5.3 for the methods in this data set. Information reviewed in the data package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the PO and DRAFT CSSA QAPP were met.

A table detailing the data qualifiers applied, removed, or changed (if any) for the samples in this WO as a result of the data validation process is included at the end of this report.

VOLATILES

General

The volatiles portion of this data package consisted of fourteen (14) groundwater samples, including one (1) TB, one (1) MS/MSD set and one (1) FD. All samples were collected on June 2, 2022 and analyzed for a reduced list of VOCs which included: *cis*-1,2-dichloroethene (cis 1,2-DCE), tetrachloroethene, trichloroethene (TCE), and vinyl chloride.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260C. The samples were analyzed in a single analytical batch, #577689, under one initial calibration (ICAL). All samples were analyzed following the procedures outlined in the DRAFT CSSA QAPP and were prepared and analyzed within the holding time required by the method. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD), the MS, MSD, and the surrogate spikes. Sample CS-13 was designated as the MS/MSD on the COC.

All LCS, LCSD, MS and MSD spike recoveries were within acceptance criteria.

All surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD and MS/MSD results. Precision was further evaluated by comparing the field duplicate analyte results. Sample CS-10_FD was collected and analyzed as the field duplicate of CS-10.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Only target VOCs above the limit of quantitation (LOQ) in both the parent and FD samples are evaluated. There were no target VOCs detected above the LOQ in either the parent or FD sample.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DRAFT CSSA QAPP;
- Comparing actual analytical procedures to those described in the DRAFT CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank and TB for cross contamination of samples during sample collection, transportation, and analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the DRAFT CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met. The ICV was prepared using a secondary source standard.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

One method blank was associated with the VOC analyses in this WO. The MB was non-detect for all target VOCs.

There was one trip blank sample associated with the VOC analyses in this WO. The TB was non-detect for all target VOCs.

Completeness

Completeness has been evaluated in accordance with the DRAFT CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All VOC results for the samples in this WO were considered usable. The completeness for this WO is 100%, which meets the minimum acceptance criteria of 90%.

ICP-AES METALS

General

The ICP portion of this WO consisted of seven (7) groundwater samples, including one (1) MS/MSD set and one (1) FD. All samples were collected on June 2, 2022. The samples were analyzed for arsenic, barium, cadmium, chromium, copper, lead, and zinc.

The ICP metals analyses were performed using USEPA SW846 Method 6010C. All samples were analyzed following the procedures outlined in the PO and DRAFT CSSA QAPP and were prepared and analyzed within the holding time required by the method. The samples for ICP metals were analyzed in batch #578132. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS, LCSD, the MS and MSD. Sample CS-13 was designated as the MS/MSD on the COC.

All LCS, LCSD, MS and MSD spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD and MS/MSD results. Precision was further evaluated by comparing the field duplicate analyte results. Sample CS-10_FD was collected and analyzed as the field duplicate of CS-10.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Only target metals above the LOQ in both the parent and FD samples are evaluated. Barium and zinc were detected above the LOQs in both the parent and FD samples. Barium and zinc both met the RPD criterion for metals of 20.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DRAFT CSSA QAPP;
- Comparing actual analytical procedures to those described in the DRAFT CSSA QAPP;
- Evaluating preservation and holding times; and
- Examining laboratory blank for cross contamination of samples during analysis.

All samples were analyzed following the COC and the analytical procedures described in the DRAFT CSSA QAPP, prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All CCV criteria were met.
- All CCVL criteria were met.
- All interference check (ICSA/ICSAB) criteria were met.
- The serial dilution test (DT) was performed on the same sample as the MS/MSD. A DT is only applicable for those target metals where the sample concentration is ≥ 50x the MDL and the MS and/or MSD failed recovery criteria. The DT was not required since the MS and MSD passed recovery criterion.
- The post digestion spike (PDS) was performed on the same samples as the MS/MSD. A PDS is only applicable for those metals that failed the MS/MSD and DT criteria. The PDS was not required since the MS and MSD passed recovery criterion.
- The initial calibration blank (ICB) and continuing calibration blank (CCB) samples were all non-detect.

One method blank was analyzed in association with the ICP analyses in this WO. The method blank was free of target metals, except as follows. Zinc was detected in MB-280-577877/1-A at 0.00173 mg/L. All associated samples contained zinc at concentrations greater than 5 times the amount in the MB, therefore corrective action was not required.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP metals results for the samples in this WO were considered usable. The completeness for the ICP metals portion of this WO is 100%, which meets the minimum acceptance criteria of 90%.

MERCURY

General

The mercury portion of this WO consisted of seven (7) groundwater samples, including one (1) MS/MSD set and one (1) FD. All samples were collected on June 2, 2022 and were analyzed for mercury.

The mercury analyses were performed using USEPA SW846 Method 7470A. The samples were analyzed following the procedures outlined in the PO and DRAFT CSSA QAPP, prepared and analyzed within the holding time required by the method.

The mercury samples were analyzed in batch #577670. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the LCS, LCSD, the MS and the MSD. Sample CS-13 was designated as the MS/MSD on the COC.

All LCS, LCSD, MS, and MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD and MS/MSD results. Precision was further evaluated by comparing the field duplicate analyte results. Sample CS-10_FD was collected and analyzed as the field duplicate of CS-10.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

Only mercury above the LOQ in both the parent and FD samples are evaluated. There was no mercury detected above the LOQ in either the parent or FD sample.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DRAFT CSSA QAPP;
- Comparing actual analytical procedures to those described in the DRAFT CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

All samples were analyzed following the COC and the analytical procedures described in the DRAFT CSSA QAPP, prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- All CCV criteria were met.
- The serial dilution test (DT) was performed on the same sample as the MS/MSD. A DT is only applicable for mercury where the sample concentration is ≥ 50x the MDL and the MS and/or MSD failed recovery criteria. The DT was not required since the MS and MSD passed recovery criterion.
- The post digestion spike (PDS) was performed on the same sample as the MS/MSD. A PDS is only applicable for mercury when it failed the MS/MSD and DT criteria. The PDS was not required since the MS and MSD passed recovery criterion.

There was one method blank, and several calibration blanks associated with the mercury analyses in this WO. All blanks were free of mercury.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Mercury result for the samples in this WO was considered usable. The completeness for the mercury portion of this WO is 100%, which meets the minimum acceptance criteria of 90%.

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.3 of the project-specific DRAFT CSSA QAPP, as follows:

Data Validation Codes and Definitions

Data Qualifiers	Definitions
U	The analyte was analyzed for, but not detected. The associated numerical value is at or below the Detection Limit (DL).
F	The analyte was positively identified; the quantitation is an estimation above the DL and below the Limit of Quantitation (LOQ).
J	The analyte was positively identified, but the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ	The analyte was analyzed for, but not detected; the associated numerical value is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	A matrix effect was present.
R	Data is rejected as unusable due to serious deficiencies in meeting certain analyte-specific quality control criteria.

DATA QUALIFIER CHANGES

There were no data qualifiers were added, removed, or changed as a result of the data validation process.

REASON CODE DEFINITIONS

The data validation reason codes were used to document the logic behind all data validation qualifiers. There were no reason codes for data qualification associated with the samples in this SDG.

DATA VERIFICATION SUMMARY REPORT

for groundwater samples collected from

CAMP STANLEY STORAGE ACTIVITY

BOERNE, TEXAS

Data Verification by: Sandra de las Fuentes
Parsons - Austin

INTRODUCTION

The following data verification summary report covers eleven groundwater samples collected from Camp Stanley Storage Activity (CSSA) May 16, 2022, 2022. The samples were assigned to the following Work Oder (WO).

280-162401

The field QC sample associated with this WO was one trip blank (TB), one matrix spike/matrix spike duplicate (MS/MSD) set, and one field duplicate (FD). No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary, due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by Eurofins TestAmerica in Denver, Colorado (ETA) following the procedures outlined in the DRAFT CSSA QAPP (pending approval, Parsons 2022) and in PO #0012175. Samples in this WO were shipped to the laboratory in a single cooler, which was received by the laboratory at an acceptable temperature of 2.8ºC.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Lab ID	Matrix	VOCs	Comments
TB-1	280-162401-1	Water	X	
LS-6-A2	280-162401-2	Water	X	
RFR-10-A2	280-162401-3	Water	X	
RFR-10-B2	280-162401-4	Water	X	
OFR-3-A2	280-162401-5	Water	X	
OFR-3-A2_FD	280-162401-6	Water	X	FD of OFR-3-A2
RFR-11-A2	280-162401-7	Water	X	
LS-5-A2	280-162401-8	Water	X	
LS-7-A2	280-162401-9	Water	X	MS/MSD

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
VOCs	Water	SW5030B	SW8260C	μg/L

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in in the DRAFT CSSA QAPP (Parsons 2022) and in PO #0012175. The control limits used to evaluate the surrogates, laboratory control samples (LCSs), and MS/MSDs are also referenced in the DoD QSM, version 5.3 for the methods in this data set. Information reviewed in the data package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the PO and DRAFT CSSA QAPP were met.

A table detailing the data qualifiers applied, removed, or changed (if any) for the samples in this WO as a result of the data validation process is included at the end of this report.

VOLATILES

General

The volatiles portion of this data package consisted of eleven (11) groundwater samples, including one (1) TB, one (1) MS/MSD set and one (1) FD. All samples were collected on May 16, 2022 and analyzed for a reduced list of VOCs which included: *cis*-1,2-dichloroethene (cis 1,2-DCE), tetrachloroethene, trichloroethene (TCE), and vinyl chloride.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260C. The samples were analyzed in one analytical batch, #575954, under one initial calibration (ICAL). All samples were analyzed following the procedures outlined in the DRAFT CSSA QAPP and were prepared and analyzed within the holding time required by the method. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD), the MS, MSD, and the surrogate spikes. Sample LS-7-A2_was designated as the MS/MSD on the COC.

All LCS, LCSD, and surrogate spike recoveries were within acceptance criteria.

All MS and MSD spike recoveries were within acceptance criteria, except as follows.

Spiked Sample: LS-7-A2

Analyte	MS %R	MSD %R	Criteria
Tetrachloroethane	72	(90)	74-129%
Trichloroethane	73	(94)	79-123%

( ) = Indicates criteria was met

Tetrachloroethane and trichloroethane were qualified as estimated (M) in the parent sample due to the low MS and MSD recoveries. The data validator revised the qualifier applied by the laboratory from 'J1' to 'M'.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD and MS/MSD results. Precision was further evaluated by comparing the field duplicate analyte results. Sample OFR-3-A2_FD was collected and analyzed as the field duplicate of OFR-3-A2.

The LCS/LCSD RPDs were within acceptance criteria.

The MS/MSD RPDs were within acceptance criteria, except as follows.

Analyte	RPD	Criteria
Tetrachloroethane	23	20
Trichloroethane	26	20

Since results for both analytes in the parent sample were non-detect, no action was required.

Only target VOCs above the limit of quantitation (LOQ) in both the parent and FD samples are evaluated. There were no target VOCs detected above the LOQ in either the parent or FD sample.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DRAFT CSSA QAPP;
- Comparing actual analytical procedures to those described in the DRAFT CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank and TB for cross contamination of samples during sample collection, transportation, and analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the DRAFT CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met. The ICV was prepared using a secondary source standard.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

One method blank was associated with the VOC analyses in this WO. The MB was non-detect for all target VOCs.

There was one trip blank sample associated with the VOC analyses in this WO. The TB was non-detect for all target VOCs.

Completeness

Completeness has been evaluated in accordance with the DRAFT CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All VOC results for the samples in this WO were considered usable. The completeness for this WO is 100%, which meets the minimum acceptance criteria of 90%.

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.3 of the project-specific DRAFT CSSA QAPP, as follows:

Data Validation Codes and Definitions

Data Qualifiers	Definitions
U	The analyte was analyzed for, but not detected. The associated numerical value is at or below the Detection Limit (DL).
F	The analyte was positively identified; the quantitation is an estimation above the DL and below the Limit of Quantitation (LOQ).
J	The analyte was positively identified, but the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ	The analyte was analyzed for, but not detected; the associated numerical value is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	A matrix effect was present.
R	Data is rejected as unusable due to serious deficiencies in meeting certain analyte-specific quality control criteria.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
LS-7-A2	Tetrachloroethane	µg/L	0.200 U J1	0.200 U M	M3
LS-7-A2	Trichloroethane	µg/L	0.160 U J1	0.200 U M	M3

REASON CODE DEFINITIONS

The data validation reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

M3: MS/MSD percent recovery Infraction with Low Bias

APPENDIX D

LTMO AND DQO APPROVAL LETTERS FROM THE TCEQ AND EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 Elm Street, Suite 500
Dallas, Texas 75270-2102

Transmitted via e-mail

September 23, 2020

Mr. John Ferguson
Acting Installation Manager
Camp Stanley Storage Activity
25800 Ralph Fair Road
Boerne, TX 78015-4800

RE: *2020 Revision of Data Quality Objectives (DQOs) – Groundwater Monitoring Program*
Camp Stanley Storage Activity, Boerne, Texas

Dear Mr. Ferguson:

The 2020 Revision of Data Quality Objectives (DQOs) – Groundwater Monitoring Program for Camp Stanley Storage Activity (CSSA) has been reviewed by the U.S. EPA in accordance with the final Resource Conservation and Recovery Act (RCRA) § 3008(h) Administrative Order on Consent for CSSA, (Order) Docket No. RCRA-VI 002(h)99-H FY99, dated May 5, 1999.

The purpose of the 2020 DQOs revision is to incorporate recent changes in the groundwater monitoring program, including implementing the 2020 Long Term Monitoring Optimization (LTMO) recommendations for both on-post and off post wells. The revised DQO's meets the temporal and spatial objectives of the CSSA groundwater monitoring program. The EPA approves the 2020 Revision, and it should be incorporated into the overall CSSA groundwater monitoring program.

Please add the 2020 DQO Revision to the Administrative Record at https://www.stanley.army.mil. If you have any questions, please feel to contact me at 214-665-8317 or via e-mail at lyssy.gregory@epa.gov.

Sincerely,

Greg J. Lyssy

Greg J. Lyssy
Senior Project Manager
RCRA Corrective Action Section (6LCR-RC)

cc: Margarita Loya, CSSA
Tim Brown, TCEQ
Jorge Salazar, TCEQ
Laurie King, EPA
Julie Burdey, Parsons
Shannon Schoepflin, Parsons
Scott Pearson. Parsons

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 Elm Street, Suite 500
Dallas, Texas 75270-2102

Transmitted via e-mail

September 18, 2020

Mr. John Ferguson
Acting Installation Manager
Camp Stanley Storage Activity
25800 Ralph Fair Road
Boerne, TX 78015-4800

RE: *RCRA Three-Tiered Long Term Monitoring Network Optimization Evaluation*
Camp Stanley Storage Activity, Boerne, Texas

Dear Mr. Ferguson:

The Three-Tiered Long Term Monitoring Network Optimization (LTMO) Evaluation, dated May 2020, for Camp Stanley Storage Activity (CSSA), has been reviewed by the U.S. EPA in accordance with the final Resource Conservation and Recovery Act (RCRA) § 3008(h) Administrative Order on Consent for CSSA, (Order) Docket No. RCRA-VI 002(h)99-H FY99, dated May 5, 1999.

The purpose of the LTMO Evaluation is to ensure that the groundwater monitoring program adequately addresses the monitoring requirements of the remedial actions at the Site, both temporally and spatially. CSSA has been collecting groundwater data since the early 1990's and has optimized the monitoring program several times to ensure that an optimal monitoring program is in place. The proposed sampling schedule in the LTMO Evaluation meets the temporal and spatial objectives of the CSSA groundwater monitoring program and is hereby approved.

Please add the Evaluation to the Administrative Record at *https://www.stanley.army.mil*. If you have any questions, please feel to contact me at 214-665-8317 or via e-mail at *lyssy.gregory@epa.gov*.

Sincerely,

Greg J. Lyssy

Greg J. Lyssy
Senior Project Manager
RCRA Corrective Action Section (6LCR-RC)

cc: Margarita Loya, CSSA
Tim Brown, TCEQ
Jorge Salazar, TCEQ
Laurie King, EPA
Julie Burdey, Parsons
Shannon Schoepflin, Parsons
Adrian Lindley, Parsons

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 18, 2020

Via E-mail

Mr. John Ferguson
Installation Manager
Camp Stanley Storage Activity
25800 Ralph Fair Road
Boerne, TX 78015

Re: Approval
Data Quality Objectives Groundwater Monitoring Program and Three-Tiered Long-Term Monitoring Network Optimization Evaluation, dated September 15, 2020
Camp Stanley Storage Activity, Boerne, Texas
TCEQ SWR No. 69026; CN602728206; RN100662840
EPA ID No. TX2210020739

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced submittal that documented the optimization of the sampling and analysis plans for the site. The TCEQ concurs with the recommended optimization; please proceed with its implementation.

Questions concerning this letter should be directed to me at (512) 239-6526. When responding by mail, please submit one paper copy and one electronic copy (on USB or disc) of all correspondence and reports to the TCEQ Remediation Division at Mail Code MC-127. An additional copy should be submitted in electronic format to the local TCEQ Region Office. The information in the reference block should be included in all submittals. Note that the electronic and hard copies should be identical, complete copies. A Correspondence ID Form (TCEQ Form 20428) must accompany each document submitted to the Remediation Division and should be affixed to the front of your submittal. The Correspondence ID Form helps ensure that your documents are identified correctly and are routed to the applicable program for a timely response.

Sincerely,

Timothy Brown, Project Manager
Team 1, VCP-CA Section
Remediation Division
Texas Commission on Environmental Quality

TKB/mdh

cc: Ms. Julie Burdy, Parsons Inc., 9101 Burnet Road, Suite 210, Austin, TX 78758
Via E-mail

Mr. Cameron Lopez, Waste Section Manager, TCEQ Region 13 Office, San Antonio
Via E-mail

APPENDIX E

WESTBAY ANALYTICAL RESULTS, JUNE 2022

Appendix E
Westbay Analytical Results, June 2022

Well ID	Date Sampled	cis-1,2-DCE (cis-1,2-dichloroethene)	TCE (trichloroethene)	PCE (tetrachloroethene)	Vinyl Chloride
CS-WB04-LGR-11	6/22/2022	0.321U	0.300U	**0.845J**	0.505UQ
CS-WB04-CC-01	6/22/2022	**1.32**	0.300U	0.403U	0.505UQ
CS-WB04-CC-02	6/22/2022	0.321U	0.300U	0.403U	0.505UQ
CS-WB04-CC-03	6/22/2022	0.321U	0.300U	0.403U	0.505UQ
Comparison Criteria					
Detection Limit	**DL**	**0.321**	**0.300**	**0.403**	**0.505**
Limit of Quantitation	**LOQ**	**1.00**	**1.00**	**1.00**	**1.50**
Max. Contaminant Level	**MCL**	**70**	**5**	**5**	**2**

Data Qualifiers
U-Undetected at the Limit of Detection.
J-The analyte was positively identified; the quantitation is an estimation.
Q-One or more quality control criteria failed.
All values are reported in µg/L.

BOLD	≥ DL
BOLD (blue)	≥ LOQ
BOLD (red)	≥ MCL