2021 Annual Groundwater Monitoring and Corrective Action Report

Martin Lake Steam Electric Station PDP 5 - Rusk County, Texas

Prepared for:

Luminant Generation Company LLC

Prepared by:

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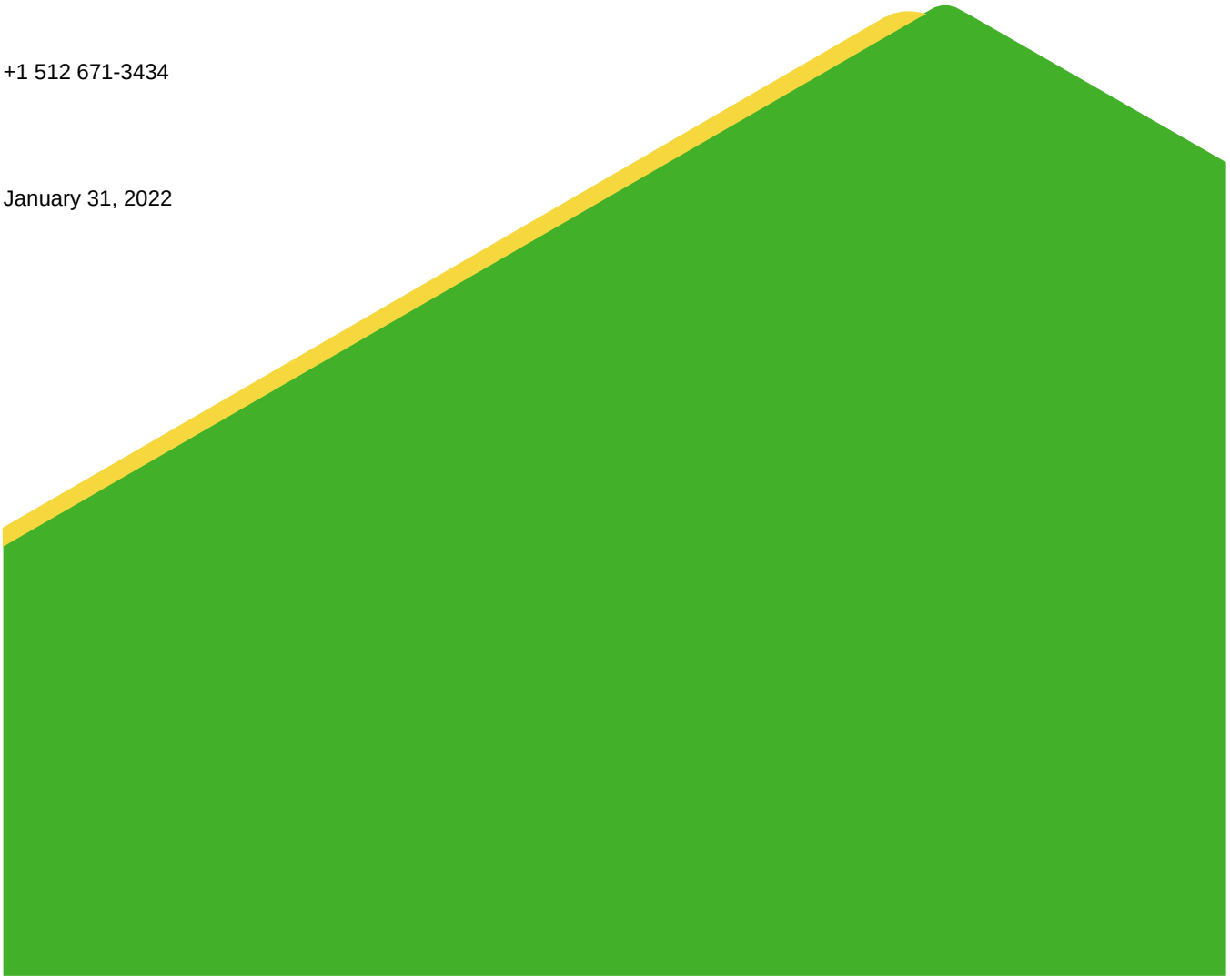

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ACRONYMS AND ABBREVIATIONS

CCR	Coal Combustion Residuals
C.F.R.	Code of Federal Regulations
GWPS	Groundwater Protection Standard
MCL	Maximum Concentration Level
mg/L	Milligrams per Liter
MLSES	Martin Lake Steam Electric Station
NA	Not Applicable
PDP	Permanent Disposal Pond
SSI	Statistically Significant Increase
SSL	Statistically Significant Level
T.A.C.	Texas Administrative Code
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

Golder Associates USA Inc. (Golder), Member of WSP, has prepared this report on behalf of Luminant Generation Company LLC (Luminant) to satisfy the 2021 annual groundwater monitoring and corrective action reporting requirements of 40 C.F.R. Part 257 and 30 T.A.C. Chapter 352 for the Permanent Disposal Pond 5 (PDP 5) (the "CCR unit") at the Martin Lake Steam Electric Station (MLSES) in Rusk County, Texas. The CCR unit and CCR monitoring well network are shown on Figure 1.

At the beginning and end of the 2021 reporting period, the CCR unit was operating under a Detection Monitoring Program as described in § 257.94. The Detection Monitoring Program for PDP 5 was established in September 2017. Statistically significant increases (SSIs) above background prediction limits were identified for several Appendix III parameters as part of the 2017 through 2020 Detection Monitoring events; however, Alternate Source Demonstrations were completed that indicated that a source other than the CCR unit caused the SSIs. During 2021, SSIs were also identified for Appendix III constituents, which included boron in well PDP-25, calcium in well PDP-23, and chloride in well MW-19. Alternate sources for the SSIs identified in the 2021 sample data are being evaluated in accordance with § 257.94. If an alternate source is not identified to be the cause of the 2021 SSIs, an Assessment Monitoring Program will be established in accordance with § 257.94(e)(2).

1.0 INTRODUCTION

The CCR Rule (40 C.F.R. 257 Subpart D - *Standards for the Receipt of Coal Combustion Residuals in Landfills and Surface Impoundments*) has been promulgated by the United States Environmental Protection Agency (USEPA) to regulate the management and disposal of CCRs as solid waste under Resource Conservation and Recovery Act (RCRA) Subtitle D. TCEQ has adopted portions of the federal CCR rule at 30 T.A.C. Chapter 352 (Texas CCR Rule), and USEPA published its final approval of the Texas CCR rule on June 28, 2021. *See* 86 Fed. Reg. 33,892 (June 28, 2021). The Texas CCR Rule became effective on July 28, 2021, and it adopts and incorporates by reference the requirements for the annual groundwater monitoring report located at 40 C.F.R. § 257.90. *See* 30 T.A.C. § 352.901. It further adopts and incorporates by reference the Federal CCR Program requirements for detection and assessment monitoring in 30 T.A.C. §352.941 and 30 T.A.C. §352.951, respectively. Pursuant to 30 T.A.C. § 352.902, this report will be submitted to TCEQ for review no later than 30 days after the report has been placed in the facility's operating record. For existing CCR landfills and surface impoundments, the CCR Rule requires that the owner or operator prepare an annual groundwater monitoring and corrective action report to document the status of the groundwater monitoring and corrective action program for the CCR unit for the previous calendar year. Per § 257.90(e) of the CCR Rule, the report should contain the following information, to the extent available:

(1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

(3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

(4) A narrative discussion of any transition between monitoring programs (*e.g.,* the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

(6) A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

    (i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

(iii) If it was determined that there was a statistically significant increase over background for one or more constituents listed in Appendix III to this part pursuant to § 257.94(e):

(A) Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and

(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.

(iv) If it was determined that there was a SSL above the groundwater protection standard for one or more constituents listed in Appendix IV to this part pursuant to § 257.95(g) include all of the following:

(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;

(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;

(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.

(v) Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

2.0 MONITORING AND CORRECTIVE ACTION PROGRAM STATUS

The PDP 5 CCR Unit is currently in a Detection Monitoring Program. Golder collected the initial Detection Monitoring Program groundwater samples from the PDP 5 CCR monitoring well network in September 2017. Subsequent Detection Monitoring Program groundwater samples have been collected on a semi-annual basis since that time. Statistical analysis of the sample data is performed in accordance with the USEPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities-Unified Guidance (USEPA 2009) to identify SSIs of Appendix III parameters over background concentrations. The Detection Monitoring Program sampling dates and parameters are summarized in the following table:

Detection Monitoring Program Summary

Sampling Dates	Parameters	SSIs	Assessment Monitoring Program Established
September 2017 February 2018 (re-samples)	Appendix III	Yes	No (Alternate Source Demonstration Completed)
June 2018 September 2018 November 2018 (re-samples)	Appendix III	Yes	No (Alternate Source Demonstration Completed)
May 2019 November 2019	Appendix III	Yes	No (Alternate Source Demonstration Completed)
May 2020 September 2020	Appendix III	Yes	No (Alternate Source Demonstration Completed)
June 2021 October 2021	Appendix III	Yes	No (Alternate Source Is Being Assessed)

The statistical background values and Appendix III analytical data are presented in Tables 1 and 2, respectively. SSIs of Appendix III parameters were identified for the 2017 through 2020 sampling events. An initial Alternate Source Demonstration was completed in 2018, which indicated that a source other than the CCR unit caused the SSIs observed in the 2017 sample data and 2018 re-sample data. Similarly, Alternate Source Demonstrations were completed in 2019 through 2021 based on the 2018 through 2020 sample data. As a result, PDP 5 has remained in the Detection Monitoring Program. A summary of the Alternate Source Demonstration based on the 2020 sample data is presented in Attachment 1 as required by § 257.94(e)(2).

Detection Monitoring Program groundwater samples were collected from the CCR groundwater monitoring network on a semi-annual basis in 2021, as required by the CCR Rule. The first 2021 semi-annual Detection Monitoring Program sampling event was conducted in June 2021. The second 2021 semi-annual Detection Monitoring Program sampling event was conducted in October 2021. The analytical data from the 2021 semi-annual Detection Monitoring Program sampling events were evaluated using procedures described in the Statistical Analysis Plan to identify SSIs of Appendix III parameters over background concentrations. SSIs of Appendix III parameters over background concentrations were identified for several constituents for which SSIs had previously been attributed to alternate sources. Alternate sources for the SSIs identified in the 2021 sample data are being evaluated in accordance with § 257.94. If an alternate source is not identified to be the cause of the SSI, an Assessment Monitoring Program will be established in accordance with § 257.94(e)(2).

3.0 KEY ACTIONS COMPLETED IN 2021

Semi-annual Detection Monitoring Program groundwater monitoring events were completed in June and October 2021. The number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and the analytical results for the groundwater samples are summarized in Table 2. A map showing the CCR unit and monitoring wells is provided as Figure 1. No CCR wells were installed or decommissioned in 2021.

An Alternate Source Demonstration was completed in March 2021, which documented that a source other than PDP 5 caused the SSIs detected over background levels during the 2020 Detection Monitoring Program sampling events, as required by § 257.94(e)(2). A copy of the 2021 Alternate Source Demonstration is provided in Attachment 1.

4.0 PROBLEMS ENCOUNTERED AND ACTIONS TO RESOLVE THE PROBLEMS

No problems were encountered with the CCR groundwater monitoring program in 2021.

5.0 KEY ACTIVITIES PLANNED FOR 2022

The following key activities are planned for 2022:

- Luminant submitted a registration application to TCEQ under the Texas CCR Rule for the Martin Lake PDP 5 on January 24, 2022.

- Continue the Detection Monitoring Program in accordance with applicable provisions of 40 C.F.R. §257.95 and 30 T.A.C. §352.941.

- If an alternate source is identified to be the cause of the SSIs observed in 2021, which are described in this report, a written demonstration will be completed within 90 days of SSI determination and included in the following Annual Groundwater Monitoring and Corrective Action Report.

- If an alternate source is not identified to be the cause of the SSIs, an Assessment Monitoring Program will be established.

6.0 REFERENCES

USEPA, 2009. Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, EPA 530/R-09-007, March.

Signature Page

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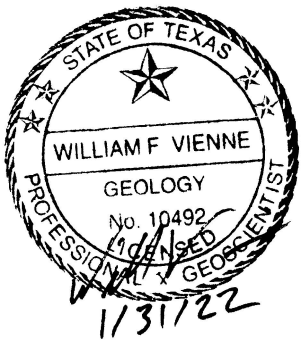
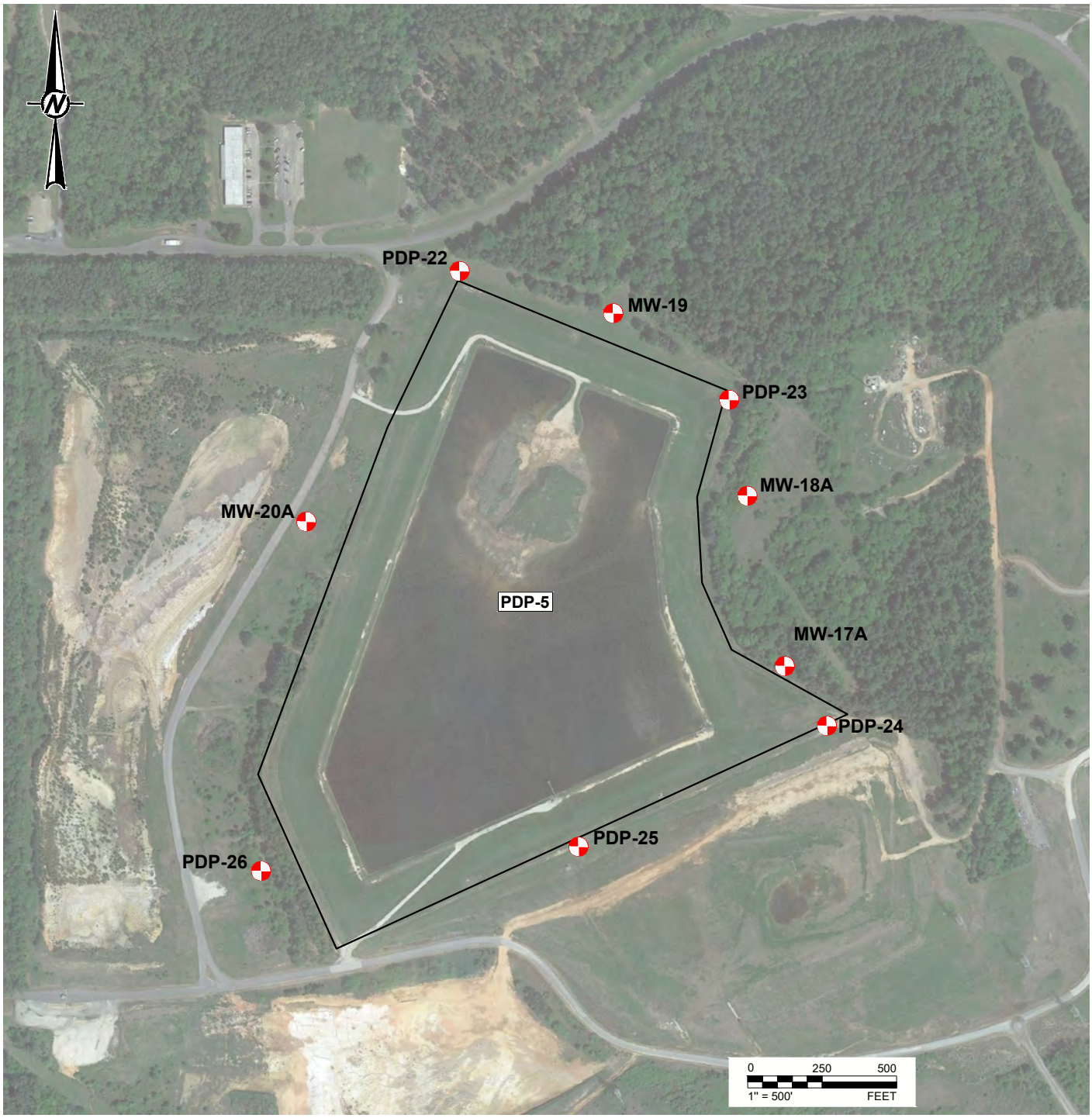


FIGURES



LEGEND

CCR MONITORING WELL

REFERENCE(S)

BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 4/9/19.

CLIENT
LUMINANT

PROJECT
MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS

TITLE
PDP 5
DETAILED SITE PLAN

CONSULTANT

GOLDER

YYYY-MM-DD	2020-04-30
DESIGNED	AJD
PREPARED	TNB
REVIEWED	WFV
APPROVED	WFV

PROJECT NO.	REV.	FIGURE
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TABLES

Table 1
Statistical Background Values
MLSES - PDP 5

Sample Location	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Flouride (mg/L)	field pH (s.u.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-17A	0.538	6.73	10.4	0.4	2.5 9.19	51.9	170
MW-18A	0.20	3.1	10.4	0.4	4.88 7.92	9.1	157
MW-19	0.782	237	57.7	0.512	4.6 8.08	672	1,380
MW-20A	0.213	25.7	12.3	0.954	3.06 8.76	148	381
PDP-22	0.411	306	32.7	1.07	4.08 8.63	216	1,780
PDP-23	0.0678	2	7.52	0.4	3.38 8.45	3.27	143
PDP-24	4.92	45.9	22.6	1.03	1.33 9.97	533	894
PDP-25	0.136	41.3	197	0.4	4.65 7.93	118	705
PDP-26	0.111	4.74	14.6	0.577	5.35 7.57	64.6	438

TABLE 2
APPENDIX III ANALYTICAL RESULTS
MLSES PDP 5

Sample Location	Date Sampled	B	Ca	Cl	F	field pH	SO_4	TDS
MW-17A	09/22/17	0.402	3.1	8.3	<0.1	6.78	31.2	111
	06/14/18	0.485	6.48	9.16	<0.1	6.87	45.9	129
	09/11/18	0.523	5.06	8.82	0.179 J	5.03	43.1	137
	05/13/19	0.497	4.88	9.18	<0.1	6.79	44.7	145
	11/07/19	0.52	5.05	8.81	<0.100	6.44	43.9	127
	05/19/20	0.521	5.09	8.74	<0.100	6.57	46.8	140
	09/25/20	0.477	5.76	10.1	<0.100	6.57	47.7	133
	06/03/21	0.534	6.21	7.83	<0.100	6.69	50.4	146
	10/05/21	0.393	3.95	8.42	<0.100	6.57	34.3	115
MW-18A	09/21/17	0.0654	1.04	5.27	<0.1	6.94	3.23	45
	06/14/18	0.102	2	6.56	<0.1	6.92	3.48	71
	09/12/18	0.211	3.23	9.06	<0.1	5.69	4.82	150
	11/7/2018 re-sample	0.128	--	--	--	--	--	--
	05/13/19	0.117	1.01	6.17	0.138 J	6.64	3.23	73
	11/07/19	0.127	11.5	6.34	<0.100	6.23	3.67	68
	05/19/20	0.225	1.54	7.09	<0.100	6.89	5.97	86
	09/25/20	0.188	1.66	8.13	<0.100	6.78	6.03	77
	06/03/21	0.188	1.73	6.2	<0.100	6.69	6.20	76
	10/05/21	0.159	1.49	6.63	<0.100	6.59	5.73	76
MW-19	09/22/17	0.0677	2.74	5.36	<0.1	6.94	1.46 J	98
	06/14/18	0.577	133	24.4	0.216 J	6.78	328	758
	09/11/18	0.243	38	65.1	0.228 J	6.04	166	597
	11/7/2018 re-sample	--	--	5.22	--	--	--	--
	05/13/19	0.429	122	26.8	0.229 J	6.72	349	813
	11/08/19	0.529	77.8	49.3	0.189 J	6.87	310	844
	05/19/20	0.0724	1.49	5.84	<0.100	6.91	1.02 J	85
	09/25/20	0.412	94.6	14.3	0.111 J	6.92	160	462
	06/03/21	0.56	140	19.5	0.352 J	6.75	336	751
	10/05/21	0.495	124	62.9	0.180 J	6.74	323	896
MW-20A	09/22/17	0.0807	17.4	12.6	0.175 J	6.71	74.2	237
	02/21/18 re-sample	--	--	10.7	--	--	--	--
	06/13/18	0.171	24	10.9	0.672	6.72	132	250
	09/11/18	0.141	7.16	11	0.235 J	4.70	39.1	154
	05/13/19	0.239	37.4	10.2	0.731	6.81	178	328
	11/08/19	0.132	9.9	10.2	0.465	6.51	88	205
	05/19/20	0.220	24	10.4	0.413	6.83	133	270
	09/25/20	0.107	8.94	12.6	0.132 J	6.68	54.3	162
	06/03/21	0.152	26.1	9.63	0.324	6.73	93.2	218
	10/05/21	0.0724	6.12	10.8	0.127 J	6.44	32.8	139

TABLE 2
APPENDIX III ANALYTICAL RESULTS
MLSES PDP 5

Sample Location	Date Sampled	B	Ca	Cl	F	field pH	SO_4	TDS
PDP-22	09/22/17	0.221	92.5	12.3	0.321 J	6.98	178	558
	06/14/18	0.115	7.78	11.8	0.239	6.63	186	491
	09/12/18	0.164	61.1	10.9	0.216 J	5.88	143	476
	05/13/19	0.158	98.2	10.1	0.303 J	6.86	184	615
	11/12/19	0.226	34.3	12.6	0.218 J	6.93	215	482
	05/19/20	0.0646	54.9	1.06	<0.100	6.55	5.21	205
	09/25/20	0.206	25.1	12.7	0.128 J	6.73	186	398
	06/03/21	0.121	73.1	6.64	<0.100	6.52	118	415
	10/05/21	0.166	27.1	10.1	0.223 J	6.78	170	376
PDP-23	09/22/17	0.0463	2.34	4.48	0.147 J	6.77	1.47 J	111
	02/21/18 re-sample	--	2.37	--	--	--	--	--
	06/13/18	0.0357	2.29	6.21	<0.1	6.82	1.26 J	98
	09/11/18	0.0760	1.96	6.38	<0.1	5.32	1.52 J	98
	11/7/2018 re-sample	0.0683	--	--	--	--	--	--
	05/13/19	0.0628	1.89	6.98	<0.1	6.68	1.28 J	103
	11/12/19	0.0675	2.14	4.98	<0.100	6.72	1.41 J	93
	05/19/20	0.0709	2.03	6.86	<0.100	6.83	1.19 J	104
	09/25/20	0.0617	2.31	7.29	<0.100	6.74	<1.00	94
	06/03/21	0.0818	2.32	6.88	<0.100	6.57	1.42 J	101
	10/05/21	0.0661	2.38	6.58	<0.100	6.59	1.02 J	97
PDP-24	09/22/17	3.01	25.8	17.5	0.898	6.95	231	440
	06/14/18	2.71	23.9	21.1	0.629	6.82	284	481
	09/11/18	4.08	41.6	19.4	0.832	4.20	460	760
	05/13/19	3.23	23	21	0.871	6.95	300	537
	11/12/19	3	21.9	20.6	0.751	6.87	295	520
	11/12/2019 DUP	2.97	22.2	20.5	0.744	6.87	300	504
	05/19/20	3.17	21.4	21	0.61	6.79	286	512
	09/25/20	4.04	40.7	19.6	0.776	6.83	445	699
	06/03/21	3.56	26.4	19.3	0.934	6.57	350	615
	10/05/21	4.24	46.9	17.8	0.782	6.72	432	681
PDP-25	09/22/17	0.133	36.8	130	0.157 J	6.81	89.1	481
	06/14/18	0.119	40.4	111	<0.1	6.78	73.4	439
	09/11/18	0.167	36.2	135	0.115 J	5.87	90.3	469
	11/7/2018 re-sample	0.142	--	--	--	--	--	--
	05/13/19	0.144	44.4	108	0.121 J	6.84	69	469
	11/12/19	0.184	38.6	117	<0.100	6.82	71.4	454
	05/19/20	0.202	53.7	105	<0.100	6.61	62.2	442
	09/25/20	0.174	46.3	123	<0.100	6.77	67.5	445
	06/03/21	0.234	45.2	101	0.236 J	6.78	61.2	431
	10/05/21	0.159	40.4	115	<0.100	6.73	62.7	427

TABLE 2
APPENDIX III ANALYTICAL RESULTS
MLSES PDP 5

Sample Location	Date Sampled	B	Ca	Cl	F	field pH	SO_4	TDS
PDP-26	09/22/17	0.0343	2.32	5.24	0.157 J	6.84	5.88	107
	06/14/18	0.0225 J	2.93	4.8	<0.1	6.89	4.27	100
	09/12/18	0.0371	2.37	4.88	<0.1	6.07	2.66 J	107
	05/13/19	0.0528	1.9	4.59	0.217 J	6.86	2.7 J	106
	11/12/19	0.0622	2.25	4.64	0.122 J	6.77	2.1 J	102
	05/19/20	0.0538	2.09	4.52	<0.100	6.64	2.1 J	108
	09/25/20	0.0549	2.71	5.07	<0.100	6.83	1.91	92
	06/03/21	0.0516	2.37	4.05	<0.100	6.84	2.18 J	104
	6/3/21 DUP	0.0635	2.23	4.05	<0.1	6.84	2.05 J	107
	10/05/21	0.0486	3.85	4.48	0.194 J	6.74	3.28	104
	10/5/21 DUP	0.0432	3.58	4.24	0.192 J	6.74	2.49 J	103

Notes:
1. All concentrations in mg/L. pH in standard units.
2. J - concentration is below sample quantitation limit; result is an estimate.

ATTACHMENT 1
ALTERNATE SOURCE DEMONSTRATION

ALTERNATE SOURCE DEMONSTRATION SUMMARY

MARTIN LAKE STEAM ELECTRIC STATION – PDP 5

Introduction

This Alternate Source Demonstration Summary was prepared to document that a source other than the Permanent Disposal Pond 5 (PDP 5) (the Site) caused the statistically significant increases (SSIs) over background levels observed during the 2020 Coal Combustion Residual (CCR) Detection Monitoring Program sampling events as required by 40 CFR 257.94(e)(2) (the "CCR Rule").

PDP-5 History and CCR Monitoring Well Network

A Site Plan showing PDP-5 and vicinity is shown on Figure 1. PDP-5 was constructed in 2010 on top of and immediately adjacent to closed and capped former pre-CCR Rule coal ash surface impoundments that began operation in 1979. PDP-5 extends significantly above natural grade and represents a localized topographic high-point relative to the surrounding area. Based on this configuration, there are no upgradient monitoring wells at PDP-5.

The CCR groundwater monitoring well system at PDP-5 consists of nine monitoring wells (MW-17A, MW-18A, MW-19, MW-20A, PDP-22, PDP-23, PDP-24, PDP-25, PDP-26). As shown on Figure 1, the wells are distributed radially along the perimeter of PDP-5 and are screened in the uppermost aquifer.

2020 Semi-Annual Detection Monitoring Results and Discussion

Detection Monitoring Program groundwater data collected from the PDP-5 CCR monitoring well network from 2017 through 2020 are summarized in Table 1. Detection Monitoring Program groundwater samples were collected on a semi-annual basis in 2020 in accordance with 40 CFR 257.94. Golder collected the first 2020 Detection Monitoring Program groundwater samples in May 2020 and the second semi-annual Detection Monitoring Program groundwater samples in September 2020. Intrawell statistical evaluations were used to identify SSIs from the 2020 Detection Monitoring Program in accordance with the procedures outlined in the Statistical Analysis Plan (SAP) (PBW, 2017).

Based on the 2020 semi-annual analytical results, SSIs were identified for boron and calcium in well PDP-25, calcium in well PDP-23, and chloride in well MW-20A. Prediction limits for boron in wells MW-18A, MW-20A, and PDP-23 were exceeded during the first semi-annual 2020 sampling event; however, since the prediction limits were not exceeded during the second semi-annual 2020 event samples from these wells, SSIs were not indicated for these constituents/wells as specified in the SAP.

The boron SSI concentrations in the 2020 groundwater samples from well PDP-25 (maximum sample concentration of 0.202 mg/L) exceeded the boron prediction limit of 0.136 mg/L for that well; however, the 2020 PDP-25 boron sample results are significantly lower than the boron sample concentrations observed at other Site wells where SSIs were not indicated. For example, six of the eight other CCR monitoring wells (MW-17A, MW-18A, MW-19, MW-20A, PDP-22, and PDP-24) had boron sample concentrations in 2020 that were higher than those observed in the PDP-25 samples, but SSIs were not indicated in these other wells. Therefore, the boron sample concentrations observed at PDP-25 are similar or less than those observed in other Site wells and are attributed to variability caused by the heterogeneity of the uppermost aquifer at the Site.

The calcium SSI concentrations in the 2020 groundwater samples from well PDP-23 (maximum sample concentration of 2.31 mg/L) exceeded the calcium prediction limit of 2.0 mg/L for that well. The calcium SSI concentrations in the 2020 groundwater samples from well PDP-25 (maximum sample concentration of 46.3 mg/L) exceeded the calcium prediction limit of 41.3 mg/L for that well. The historical variability of calcium in groundwater samples collected Site-wide has been high, ranging from about 1 mg/L to 133 mg/L. The calcium SSI sample concentrations observed at PDP-23 and PDP-25 fall in this historical range. Also, two wells (MW-19 and PDP-22) sampled during 2020 that did not have SSIs had calcium sample concentrations that were higher than the maximum calcium SSI observed in 2020. Therefore, the calcium sample concentrations observed at PDP-23 and PDP-25 are similar or less than those observed in other Site wells and are attributed to variability caused by the heterogeneity of the uppermost aquifer at the Site.

The chloride SSI concentration in well MW-20A in September 2020 (12.6 mg/L) slightly exceeded the chloride prediction limit (12.3 mg/L) for that well. The chloride sample concentration from well MW-20A in May 2020 (10.4 mg/L) was below the chloride prediction limit for that well; however, the September 2020 chloride sample result was assumed to be an SSI because a confirmation sample was not collected after the September 2020 sampling event. Four of the eight other CCR monitoring wells (MW-19, PDP-22, PDP-24, and PDP-25) had chloride sample concentrations in 2020 that were higher than those observed in the PDP-20A SSI sample, but SSIs were not indicated in these other wells. Also, the PDP-20A SSI sample chloride concentration was below the Site-wide average concentration of 22 mg/L. Therefore, the chloride sample SSI concentration observed at MW-20A is similar or less than those observed in other Site wells and is attributed to variability caused by the heterogeneity of the uppermost aquifer at the Site.

It should also be noted that groundwater conditions in the vicinity of PDP-5 are influenced by the closed and capped former pre-CCR Rule coal ash surface impoundments beneath and adjacent to PDP-5. As a result, Detection Monitoring groundwater concentrations identified as SSIs may also be attributable to historical operation of the closed former surface impoundments in addition to the natural variability caused by the heterogeneity of the groundwater system at the Site.

Conclusion

SSIs were identified for boron, calcium, and chloride during the 2020 Detection Monitoring Program sampling events at PDP 5. All observed SSIs are attributed to natural variation in groundwater quality due to the heterogeneity of the groundwater system and to potential effects from the closed former non-CCR Rule coal ash surface impoundments in the vicinity of PDP 5. The SSIs identified in the 2020 sample data are not considered evidence of a release from the CCR unit. In accordance with Section 257.94(e)(2), Luminant should continue the Detection Monitoring Program. Initiation of an Assessment Monitoring Program is not required at this time.

References

Pastor, Behling & Wheeler, LLC (PBW), 2017. Coal Combustion Residual Rule, Statistical Analysis Plan, PDP 5, Rusk County, Texas. October 11, 2017.

PROFESSIONAL CERTIFICATION

This document and all attachments were prepared by Golder Associates Inc. under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I hereby certify that the alternative source demonstration at the referenced facility meets the requirements of Section 257.94(e)(2) of the CCR Rule.

Patrick J. Behling, P.E.
Principal Engineer
GOLDER ASSOCIATES INC.

TABLE 1
CCR Groundwater Detection Monitoring Data Summary
Martin Lake Steam Electric Station - PDP 5

Sample	Date	B		Ca		Cl		Fl		field pH		SO_4		TDS	
Location	Sampled	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data
MW-17A	09/22/17	0.538	0.402	6.73	3.1	10.4	8.3	0.4	<0.1	2.5 9.19	6.78	51.9	31.2	170	111
	06/14/18		0.485		6.48		9.16		<0.1		6.87		45.9		129
	09/11/18		0.523		5.06		8.82		0.179 J		5.03		43.1		137
	05/13/19		0.497		4.88		9.18		<0.1		6.79		44.7		145
	11/7/2019		0.52		5.05		8.81		<0.100		6.44		43.9		127
	5/19/2020		0.521		5.09		8.74		<0.100		6.57		46.8		140
	9/25/2020		0.477		5.76		10.1		<0.100		6.57		47.7		133
MW-18A	09/21/17	0.20	0.0654	3.1	1.04	10.4	5.27	0.4	<0.1	4.88 7.92	6.94	9.1	3.23	157	45
	06/14/18		0.102		2		6.56		<0.1		6.92		3.48		71
	09/12/18		0.211		3.23		9.06		<0.1		5.69		4.82		150
	11/7/2018 re-sample		0.128		--		--		--		--		--		--
	05/13/19		0.117		1.01		6.17		0.138 J		6.64		3.23		73
	11/7/2019		0.127		11.5		6.34		<0.100		6.23		3.67		68
	5/19/2020		0.225		1.54		7.09		<0.100		6.89		5.97		86
	9/25/2020		0.188		1.66		8.13		<0.100		6.78		6.03		77
MW-19	09/22/17	0.782	0.0677	237	2.74	57.7	5.36	0.512	<0.1	4.6 8.08	6.94	672	1.46 J	1,380	98
	06/14/18		0.577		133		24.4		0.216 J		6.78		328		758
	09/11/18		0.243		38		65.1		0.228 J		6.04		166		597
	11/7/2018 re-sample		--		--		5.22		--		--		--		--
	05/13/19		0.429		122		26.8		0.229 J		6.72		349		813
	11/8/2019		0.529		77.8		49.3		0.189 J		6.87		310		844
	5/19/2020		0.0724		1.49		5.84		<0.100		6.91		1.02 J		85
	9/25/2020		0.412		94.6		14.3		0.111 J		6.92		160		462

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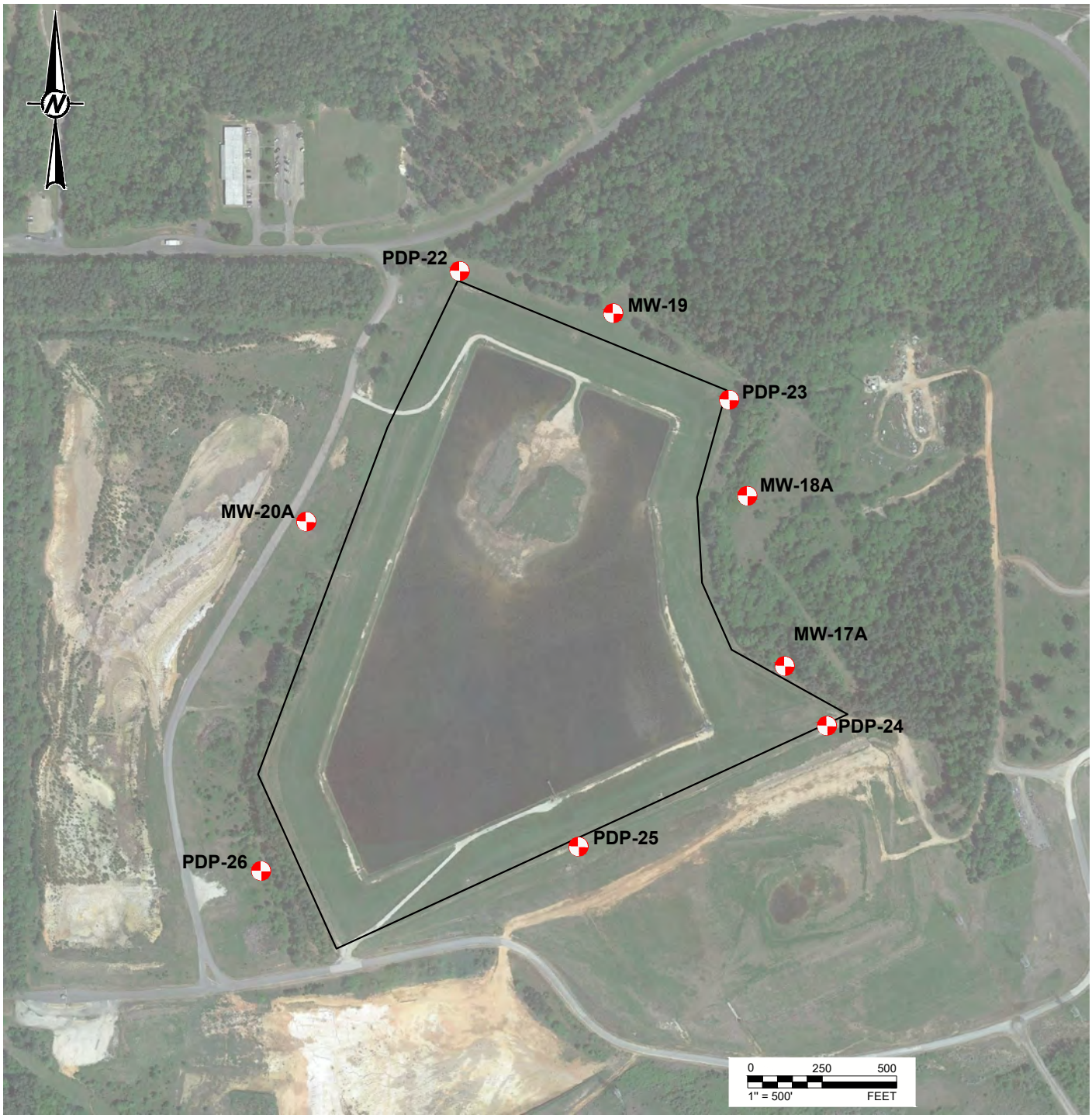
Sample	Date	B		Ca		Cl		Fl		field pH		SO_4		TDS	
Location	Sampled	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data
MW-20A	09/22/17	0.213	0.0807	25.7	17.4	12.3	12.6	0.954	0.175 J	3.06 8.76	6.71	148	74.2	381	237
	02/21/18 re-sample		--		--		10.7		--		--		--		--
	06/13/18		0.171		24		10.9		0.672		6.72		132		250
	09/11/18		0.141		7.16		11		0.235 J		4.70		39.1		154
	05/13/19		0.239		37.4		10.2		0.731		6.81		178		328
	11/8/2019		0.132		9.9		10.2		0.465		6.51		88		205
	5/19/2020		0.22		24		10.4		0.413		6.83		133		270
	9/25/2020		0.107		8.94		12.6		0.132 J		6.68		54.3		162
PDP-22	09/22/17	0.411	0.221	306	92.5	32.7	12.3	1.07	0.321 J	4.08 8.63	6.98	216	178	1,780	558
	06/14/18		0.115		7.78		11.8		0.239		6.63		186		491
	09/12/18		0.164		61.1		10.9		0.216 J		5.88		143		476
	05/13/19		0.158		98.2		10.1		0.303 J		6.86		184		615
	11/12/2019		0.226		34.3		12.6		0.218 J		6.93		215		482
	5/19/2020		0.0646		54.9		1.06		<0.100		6.55		5.21		205
	9/25/2020		0.206		25.1		12.7		0.128 J		6.73		186		398
PDP-23	09/22/17	0.0678	0.0463	2	2.34	7.52	4.48	0.4	0.147 J	3.38 8.45	6.77	3.27	1.47 J	143	111
	02/21/18 re-sample		--		2.37		--		--		--		--		--
	06/13/18		0.0357		2.29		6.21		<0.1		6.82		1.26 J		98
	09/11/18		0.0760		1.96		6.38		<0.1		5.32		1.52 J		98
	11/7/2018 re-sample		0.0683		--		--		--		--		--		--
	05/13/19		0.0628		1.89		6.98		<0.1		6.68		1.28 J		103
	11/12/2019		0.0675		2.14		4.98		<0.100		6.72		1.41 J		93
	5/19/2020		0.0709		2.03		6.86		<0.100		6.83		1.19 J		104
	9/25/2020		0.0617		2.31		7.29		<0.100		6.74		<1.00		94

TABLE 1
CCR Groundwater Detection Monitoring Data Summary
Martin Lake Steam Electric Station - PDP 5

Sample	Date	B		Ca		Cl		Fl		field pH		SO_4		TDS	
Location	Sampled	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data	Prediction Limit	Sample Data
PDP-24	09/22/17	4.92	3.01	45.9	25.8	22.6	17.5	1.03	0.898	1.33 9.97	6.95	533	231	894	440
	06/14/18		2.71		23.9		21.1		0.629		6.82		284		481
	09/11/18		4.08		41.6		19.4		0.832		4.20		460		760
	05/13/19		3.23		23		21		0.871		6.95		300		537
	11/12/2019		3		21.9		20.6		0.751		6.87		295		520
	11/12/2019		2.97		22.2		20.5		0.744		6.87		300		504
	5/19/2020		3.17		21.4		21		0.61		6.79		286		512
	9/25/2020		4.04		40.7		19.6		0.776		6.83		445		699
PDP-25	09/22/17	0.136	0.133	41.3	36.8	197	130	0.4	0.157 J	4.65 7.93	6.81	118	89.1	705	481
	06/14/18		0.119		40.4		111		<0.1		6.78		73.4		439
	09/11/18		0.167		36.2		135		0.115 J		5.87		90.3		469
	11/7/2018 re-sample		0.142		--		--		--		--		--		--
	05/13/19		0.144		44.4		108		0.121 J		6.84		69		469
	11/12/2019		0.184		38.6		117		<0.100		6.82		71.4		454
	5/19/2020		0.202		53.7		105		<0.100		6.61		62.2		442
	9/25/2020		0.174		46.3		123		<0.100		6.77		67.5		445
PDP-26	09/22/17	0.111	0.0343	4.74	2.32	14.6	5.24	0.577	0.157 J	5.35 7.57	6.84	64.6	5.88	438	107
	06/14/18		0.0225 J		2.93		4.8		<0.1		6.89		4.27		100
	09/12/18		0.0371		2.37		4.88		<0.1		6.07		2.66 J		107
	05/13/19		0.0528		1.9		4.59		0.217 J		6.86		2.7 J		106
	11/12/2019		0.0622		2.25		4.64		0.122 J		6.77		2.1 J		102
	5/19/2020		0.0538		2.09		4.52		<0.100		6.64		2.1 J		108
	9/25/2020		0.0549		2.71		5.07		<0.100		6.83		1.91		92

Notes:
1. All concentrations in mg/L. pH in standard units.
2. J - concentration is below sample quantitation limit; result is an estimate.



LEGEND

CCR MONITORING WELL

REFERENCE(S)

BASE MAP TAKEN FROM GOOGLE EARTH, IMAGERY DATED 4/9/19.

CLIENT
LUMINANT

PROJECT
MARTIN LAKE STEAM ELECTRIC STATION
TATUM, TEXAS

TITLE
PDP 5
SITE MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2020-04-30
DESIGNED	AJD
PREPARED	TNB
REVIEWED	WFV
APPROVED	WFV

PROJECT NO.	REV.	FIGURE
20142271	0	1

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