

Annual Groundwater Monitoring Report Secondary E Pond Unit (Unit 003)

Limestone Electric Generating Station,
Jewett, Texas

January 30, 2018

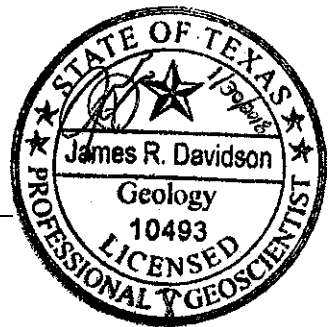
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NRG Texas Power, LLC

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Monitoring Report
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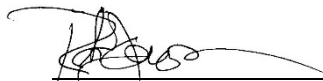
Project No. 0382496
Limestone Electric Generating Station
Jewett, Texas



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INTRODUCTION

NRG Texas Power, LLC's (NRG) Limestone Electric Generating Station, (Limestone, the Site) is located northwest of Jewett, near the borders of Limestone, Freestone, and Leon Counties (Figure 1-1). The Site is bisected by Farm-to-Market Road 39 (FM39) with the electricity generating portion to the west of FM39 in Limestone County and a solid waste disposal area (SWDA) to the east of FM39 in Freestone County. Limestone utilizes lignite and western coal as a fuel source to power the boilers. The spent coal fuels or coal combustion residuals (CCR) have been classified by the Texas Commission on Environmental Quality (TCEQ) as a Class II Nonhazardous waste and consist of fly ash, bottom ash and flue gas desulfurization (FGD) scrubber sludge. The Site has a total of five active CCR units that are subject to regulation under Title 40, Code of Federal Regulations, Part 257 (40 CFR §257) (a.k.a. the CCR Rule). These five units include the E Pond, Secondary E Pond, ST-18, K Pond and the Landfill.

This report was produced by Environmental Resource Management (ERM), on behalf of NRG Texas Power, LLC, and focuses on the initial annual groundwater monitoring results for the Sec. E Pond in compliance with the CCR Rule. The report summarizes the groundwater sampling activity at the Site over the last two years as required by §257.90. Consistent with the notification requirements of the Rule, this annual groundwater monitoring report will be posted to the operational record, notification will be made to the State of Texas, and the report will be placed on the publically accessible internet site. (§257.105(h), §257.106(h), §257.107(h)). The report must be posted to the operational record no later than January 31, 2018. Table 1-1 cross references the reporting requirements under the CCR Rule with the contents of this report.

The Secondary E Pond Unit is used for the stabilization of FGD residuals from the chloride purge storage tank, and wastewater from the E Pond, which includes FGD wastewater and storm water containing FGD solids, bottom ash and fly ash. These materials are temporarily stored in the Secondary E Pond before final disposition in the onsite Landfill.

TABLE 1-1: *Regulatory Requirement Cross-Reference Table*

Regulatory Citation in 40 CFR §257	Requirement (paraphrased)	Associated Section in this Report
§257.90(e)	Status of the groundwater monitoring program.	Section 2.0
§257.90(e)	Summarize key actions completed.	Section 2.2
§257.90(e)	Describe any problems encountered.	Section 2.0
§257.90(e)	Key activities for upcoming year.	Section 3.0
§257.90(e)(1)	Map, aerial image or diagram of CCR Unit and monitor wells	Figure 2-1
§257.90(e)(2)	Identification of new monitor wells installed or abandoned during the preceding year.	There were no new monitor wells installed or abandoned during the preceding year.
§257.90(e)(3)	Summary of groundwater data, wells sampled, date sampled, and whether sample was required under detection or assessment monitoring.	Tables 2-1 and 2-2, Appendix A
§257.90(e)(4)	Narrative Discussion of any transition between monitoring programs.	Section 3.0

2.0 *PROGRAM STATUS*

Over the past two years, samples were collected from the certified monitoring network of one upgradient monitor well, MW-29, and three downgradient monitor wells MW-5, MW-43 and MW-44. Boring logs from the wells indicate the lithology consists mainly of silty sand with gradations into and from clayey sand and sandy clay at various intervals. Historic wells in the SWDA to the south of Lynn Creek indicate the lower boundary of the aquifer's confining unit is clay between 50 - 60 ft bgs.

The well locations can be viewed on the site location map provided in Figure 2-1. No problems were encountered in the data collection or in well performance, and no action was required to resolve any issues. No new wells were installed or decommissioned after the certification of the well network.

2.1 *GROUNDWATER FLOW RATE AND DIRECTION*

Depth to groundwater measurements were made at each monitor well prior to each sampling event. Groundwater elevations, calculated by subtracting the depth to groundwater from the surveyed reference elevation for each well, were reviewed for each sampling event. Potentiometric surface maps can be found in Figure 2-2.

The hydraulic gradient for the eight sampling events was consistently northerly toward Lynn Creek. Based on the most-recent measured hydraulic gradient of 0.0016 feet per foot (ERM, 2017) and an assumed porosity of 0.3, the calculated velocity of groundwater in the alluvial aquifer beneath the E Pond is estimated to be approximately 2.3 feet per year.

2.2 *SAMPLING SUMMARY*

A summary of the total number of samples collected for each well is provided in Table 1 and 2. Table 2-1 displays the wells upgradient of the CCR Unit while Table 2-2 displays the wells downgradient of the CCR Unit.

TABLE 2-1: Sampling Dates for Each Upgradient Well

Sample Date	MW-29
2016-05-24	X
2016-08-09	X
2016-10-05	X
2016-11-22	X
2017-01-19	X
2017-03-01	X
2017-03-28	X
2017-08-24	X
2017-10-10	X
Total	9

TABLE 2-2: Sampling Dates for Each Downgradient Well

Sample Date	MW-05	MW-43	MW-44
2015-04-21	X		
2015-07-14	X		
2015-10-27	X		
2016-01-19	X		
2016-05-24	X		
2016-08-09	X		
2016-10-05	X		
2016-11-22	X		
2016-12-15		X	X
2017-01-18		X	
2017-01-19			X
2017-03-01		X	X
2017-03-28	X	X	X
2017-04-25			X
2017-04-26		X	
2017-05-31			X
2017-06-01		X	
2017-06-28		X	X
2017-08-23		X	X
2017-10-11	X	X	X
Total	10	9	9

Monitor wells were sampled for the Appendix III and Appendix IV analytes during sampling events performed through August 2017. Samples collected in October 2017 were analyzed for Appendix III analytes only. A summary of the data collected is provided in Appendix A.

2.3

DATA QUALITY

ERM reviewed field and laboratory documentation to assess the validity, reliability and usability of the analytical results. Samples from the sampling events were sent to TestAmerica Laboratories, Inc. (TestAmerica), located in Houston, Texas for analysis. TestAmerica - Houston made arrangements for samples to be transported to TestAmerica located in Corpus Christi, Texas for analysis of select constituents. Chain-of-Custody procedures were followed throughout the sample handling process. Data quality information reviewed for these results included field sampling forms, chain-of-custody documentation, holding times, lab methods, cooler temperatures, laboratory method blanks, laboratory control sample recoveries, field duplicate samples, matrix spikes / matrix spike duplicates, quantitation limits, and equipment blanks following the Texas Risk Reduction Program requirements (TRRP-13). The data quality review found the results to be valid, reliable, and useable for decision making purposes with the listed qualifiers. No analytical results were rejected.

3.0

RECOMMENDATIONS

As the initial sample dataset has been collected, statistical analysis to determine upper prediction limits for comparisons of future groundwater results will be reported in the 2018 Annual Groundwater Monitoring Report. The first round of sampling for Detection Monitoring will be conducted during the First Half of 2018.

4.0

REFERENCES

ERM, 2017. *Ground Water Monitoring Networks for Coal Combustion Residual (CCR) Rule*. Jewett, TX, October 2017.

Figures

January 30, 2018
Project No. 0382496

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SOURCE: GOOGLE EARTH PRO

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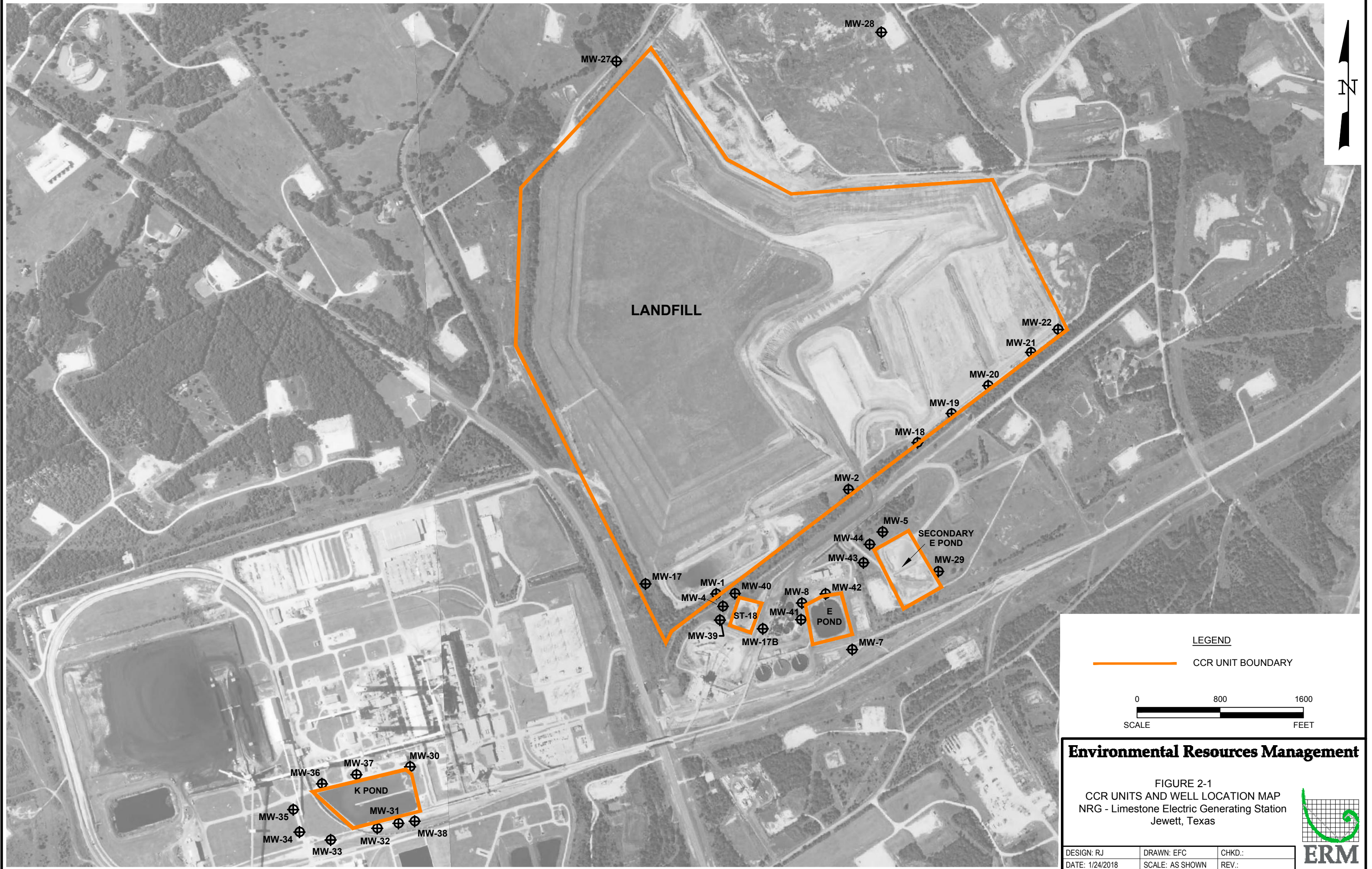
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FIGURE 1-1
Site Location Map
NRG Limestone Generating Station
Jewett, Texas





LEGEND


— CCR UNIT BOUNDARY

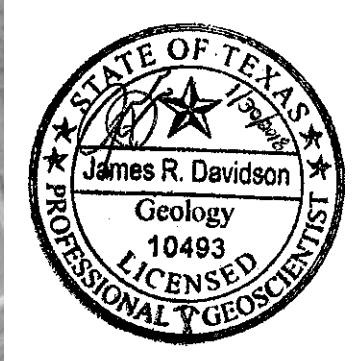
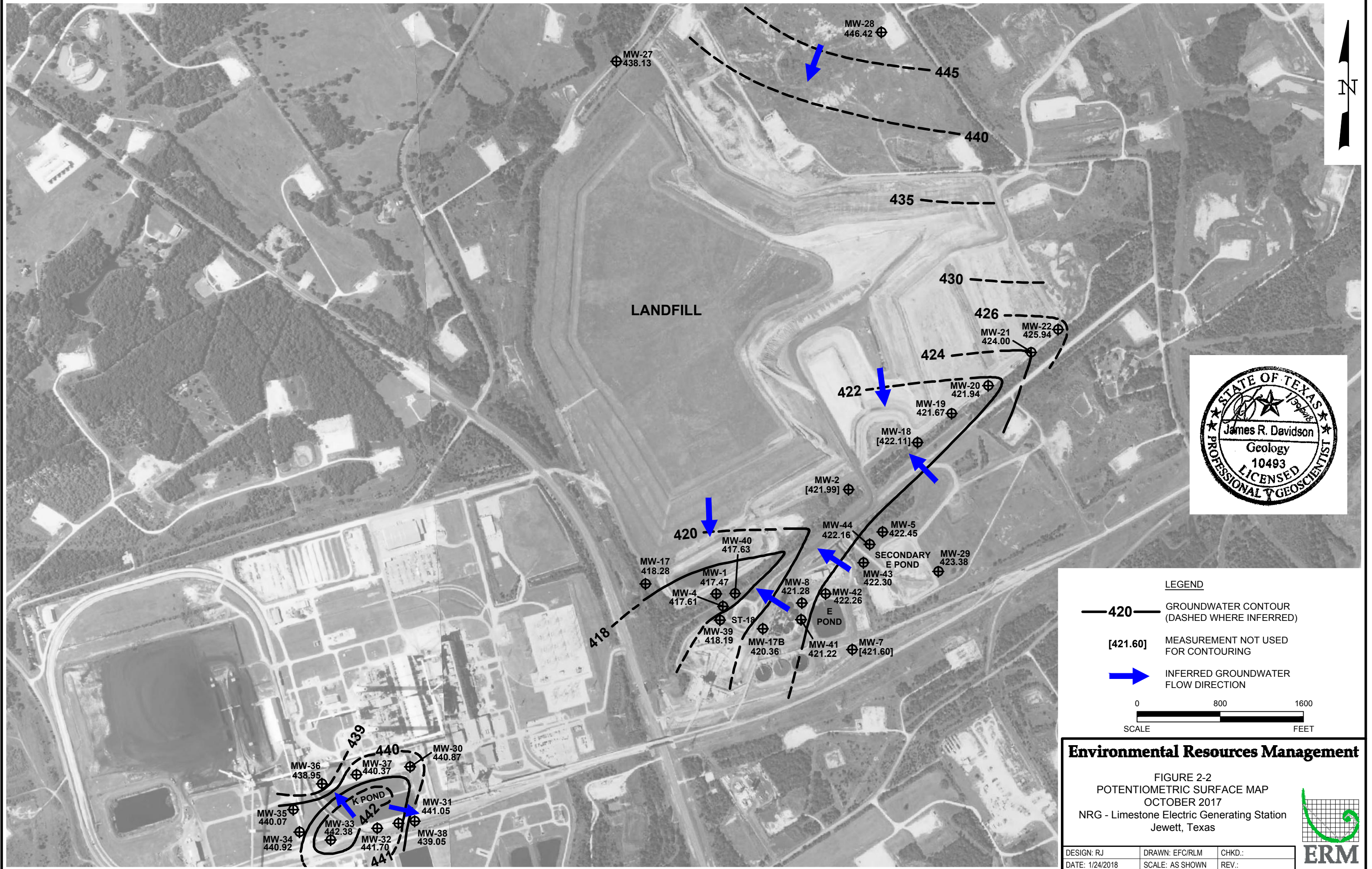
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FIGURE 2-1
CCR UNITS AND WELL LOCATION MAP
NRG - Limestone Electric Generating Station
Jewett, Texas

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DATE: 1/24/2018	SCALE: AS SHOWN	REV.:





LEGEND

- 420** GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- [421.60]** MEASUREMENT NOT USED FOR CONTOURING
- INFERRED GROUNDWATER FLOW DIRECTION**

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FIGURE 2-2
POTENTIOMETRIC SURFACE MAP
OCTOBER 2017
NRG - Limestone Electric Generating Station
Jewett, Texas

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DATE: 1/24/2018	SCALE: AS SHOWN	REV.:

Summary of Analytical Results
Appendix A

January 30, 2018
Project No. 0382496

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Appendix A
 Summary of Analytical Results
 NRG - Limestone Electrical Generating Station
 Jewett, Texas

FACILITY_CODE	SYS_CODE	SAMPLE_CODE	SYS_LOC_CODE	SAMPLE_TYPE_CODE	SAMPLE_DATE	MATRIX_CODE	SUBFACILITY_CODE	WEATHER_CONDITION	CUSTOM_FIELD_D_1	GEOLOGIC_UNIT_CODE	TEST_TYPE	LOC_DESC	FRACTION	ANALYTIC_METHOD	CAS_NUMBER	CHEMICAL_NAME	REPORT_RESULT	REPORT_UNITS	REPORT_FLAG	LAB_QUALIFIER	INTERPRETED	DETECT_FLAG	METHOD	REPORTING_QUANTITY	QUANTIFICATION_LIMIT
NRG-Limestone	MW-5-2015042	MW-05	N	N	4/21/2015	WG	Sec. E Pond				Initial	Downgradient	N	E300	16984-48-8	Fluoride	0.136	mg/L	J	J	Y	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2015042	MW-05	N	N	4/21/2015	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	308	mg/L			Y	20.0	20.0	20.0	
NRG-Limestone	MW-5-2015042	MW-05	N	N	4/21/2015	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2015042	MW-05	N	N	4/21/2015	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	35.3	mg/L			Y	0.198	0.500	0.500	
NRG-Limestone	MW-5-2015042	MW-05	N	N	4/21/2015	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	5.86	pH units			Y				
NRG-Limestone	MW-5-2015071	MW-05	N	N	7/14/2015	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8	Sulfate	186	mg/L			Y	0.479	2.50	2.50	
NRG-Limestone	MW-5-2015071	MW-05	N	N	7/14/2015	WG	Sec. E Pond				Initial	Downgradient	N	E300	16887-00-6	Chloride	22.2	mg/L			Y	0.0534	0.400	0.400	
NRG-Limestone	MW-5-2015071	MW-05	N	N	7/14/2015	WG	Sec. E Pond				Initial	Downgradient	T	E300	16984-48-8	Fluoride	0.228	mg/L			Y	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2015071	MW-05	N	N	7/14/2015	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	354	mg/L			Y	20.0	20.0	20.0	
NRG-Limestone	MW-5-2015071	MW-05	N	N	7/14/2015	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2015071	MW-05	N	N	7/14/2015	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	36.7	mg/L			Y	0.198	0.500	0.500	
NRG-Limestone	MW-5-2015071	MW-05	N	N	7/14/2015	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	5.38	pH units			Y				
NRG-Limestone	MW-5-2015102	MW-05	N	N	10/27/2015	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8	Sulfate	182	mg/L			Y	0.479	2.50	2.50	
NRG-Limestone	MW-5-2015102	MW-05	N	N	10/27/2015	WG	Sec. E Pond				Initial	Downgradient	N	E300	16887-00-6	Chloride	19.2	mg/L			Y	0.0534	0.400	0.400	
NRG-Limestone	MW-5-2015102	MW-05	N	N	10/27/2015	WG	Sec. E Pond				Initial	Downgradient	N	E300	16984-48-8	Fluoride	0.207	mg/L			Y	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2015102	MW-05	N	N	10/27/2015	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	533	mg/L			Y	10.0	10.0	10.0	
NRG-Limestone	MW-5-2015102	MW-05	N	N	10/27/2015	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2015102	MW-05	N	N	10/27/2015	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	37.4	mg/L			Y	0.198	0.500	0.500	
NRG-Limestone	MW-5-2015102	MW-05	N	N	10/27/2015	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	5.78	pH units			Y				
NRG-Limestone	MW-5-2016011	MW-05	N	N	1/19/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8	Sulfate	197	mg/L			Y	0.957	5.00	5.00	
NRG-Limestone	MW-5-2016011	MW-05	N	N	1/19/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16887-00-6	Chloride	21.2	mg/L			Y	0.0534	0.400	0.400	
NRG-Limestone	MW-5-2016011	MW-05	N	N	1/19/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16984-48-8	Fluoride	0.2	mg/L	U	U	N	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2016011	MW-05	N	N	1/19/2016	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	379	mg/L			Y	10.0	10.0	10.0	
NRG-Limestone	MW-5-2016011	MW-05	N	N	1/19/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2016011	MW-05	N	N	1/19/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	41.6	mg/L			Y	0.198	0.500	0.500	
NRG-Limestone	MW-5-2016011	MW-05	N	N	1/19/2016	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	6	pH units			Y				
NRG-Limestone	MW-5-2016052	MW-05	N	N	5/24/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8	Sulfate	250	mg/L			Y	1.9	10	10	
NRG-Limestone	MW-5-2016052	MW-05	N	N	5/24/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16887-00-6	Chloride	25	mg/L			Y	0.0534	0.400	0.400	
NRG-Limestone	MW-5-2016052	MW-05	N	N	5/24/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16984-48-8	Fluoride	0.25	mg/L			Y	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2016052	MW-05	N	N	5/24/2016	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	570	mg/L			Y	10	10	10	
NRG-Limestone	MW-5-2016052	MW-05	N	N	5/24/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2016052	MW-05	N	N	5/24/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	44	mg/L			Y	0.20	0.50	0.50	
NRG-Limestone	MW-5-2016052	MW-05	N	N	5/24/2016	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	5.62	pH units			Y				
NRG-Limestone	MW-5-2016080	MW-05	N	N	8/9/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8	Sulfate	154	mg/L			J	1.91	10.0	10.0	
NRG-Limestone	MW-5-2016080	MW-05	N	N	8/9/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16887-00-6	Chloride	26	mg/L	F1	J	Y	0.0534	0.400	0.400	
NRG-Limestone	MW-5-2016080	MW-05	N	N	8/9/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16984-48-8	Fluoride	0.39	mg/L			Y	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2016080	MW-05	N	N	8/9/2016	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	290	mg/L			Y	10.0	10.0	10.0	
NRG-Limestone	MW-5-2016080	MW-05	N	N	8/9/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2016080	MW-05	N	N	8/9/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	32.4	mg/L	b	JB	Y	0.198	0.500	0.500	
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	5.92	pH units			Y				
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8	Sulfate	142	mg/L			Y	1.91	10.0	10.0	
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16887-00-6	Chloride	25.2	mg/L			Y	0.0534	0.400	0.400	
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16984-48-8	Fluoride	0.355	mg/L			Y	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	565	mg/L			Y	10.0	10.0	10.0	
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	27.1	mg/L			Y	0.198	0.500	0.500	
NRG-Limestone	MW-5-2016100	MW-05	N	N	10/5/2016	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	5.57	pH units			Y				
NRG-Limestone	MW-5-2016112	MW-05	N	N	11/22/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8	Sulfate	110	mg/L			Y	0.48	2.5	2.5	
NRG-Limestone	MW-5-2016112	MW-05	N	N	11/22/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16887-00-6	Chloride	28	mg/L			Y	0.27	2.0	2.0	
NRG-Limestone	MW-5-2016112	MW-05	N	N	11/22/2016	WG	Sec. E Pond				Initial	Downgradient	N	E300	16984-48-8	Fluoride	0.45	mg/L			Y	0.0601	0.200	0.200	
NRG-Limestone	MW-5-2016112	MW-05	N	N	11/22/2016	WG	Sec. E Pond				Initial	Downgradient	T	SM 2540C	TDS	Total dissolved	400	mg/L			Y	10	10	10	
NRG-Limestone	MW-5-2016112	MW-05	N	N	11/22/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-42-8	Boron	0.1	mg/L	U ^a	U	N	0.0700	0.100	0.100	
NRG-Limestone	MW-5-2016112	MW-05	N	N	11/22/2016	WG	Sec. E Pond				Initial	Downgradient	T	SW6020	7440-70-2	Calcium	25	mg/L			Y	0.20	0.50	0.50	
NRG-Limestone	MW-5-2017032	MW-05	N	N	3/28/2017	WG	Sec. E Pond				Initial	Downgradient	N	FIELD	F-PHW	pH, Field	5.72	pH units			Y				
NRG-Limestone	MW-5-2017032	MW-05	N	N	3/28/2017	WG	Sec. E Pond				Initial	Downgradient	N	E300	14808-79-8										