CCR COMPLIANCE
GROUNDWATER MONITORING AND CORRECTIVE ACTION
ANNUAL REPORT
DUNKIRK LANDFILL

Prepared for:

Dunkirk Power LLC
Dunkirk Generating Station
Dunkirk, New York

Prepared by:

Aptim Environmental & Infrastructure, LLC
Pittsburgh, Pennsylvania

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Executive Summary

In response to the newly adopted Part A elements (effective September 28, 2020) of the Coal Combustion Residuals (CCR) Rule (or Rule), this Executive Summary has been incorporated into the annual report per the specific provisions as codified in Title 40 Code of Federal Regulations (CFR) §257.90(e)(6). These provisions require that an up-front overview of the current status (covering the immediately preceding calendar year) of groundwater monitoring and corrective action programs be provided in a concise and focused manner for each CCR unit at the facility. Accordingly, the following paragraphs document the respective groundwater monitoring status (for Calendar Year 2021) of the Dunkirk Landfill at the Dunkirk Generating Station, owned by Dunkirk Power LLC. Tables, figures and/or appendices referenced in the discussions below are included at the end of the report and further support the text (Section 2.0) in the main body of the report.

As shown on Figure 1, the Landfill maintains a CCR groundwater monitoring network comprised of five wells, including one upgradient location (Well BR-14-UG) and four downgradient locations (Wells BR-3-DG, BR-12-DG, BR-13-DG, and BR-20-DG). For Calendar Year 2021, the Landfill entered and ended the period in the Assessment Monitoring Program. The Landfill has remained in Assessment Monitoring since being transitioned in early-2018 following confirmed statistically significant increases (SSIs) for several CCR Appendix III constituents, including boron, calcium, chloride, fluoride, and total dissolved solids (TDS) in the downgradient wells (see Table 1).

Assessment Monitoring events for the current period were conducted in May and October 2021 (see Table 2). During the May event, lithium in downgradient Wells BR-3-DG and BR-12-DG was measured at an elevated concentration, actually marking the first detectable levels of lithium in each of these wells since the inception of the CCR monitoring program. Coincidentally, a detectable level of lithium was also measured for the first time in upgradient Well BR-14-UG. With these results being initially suspect in nature, additional evaluation including re-sampling and split-sample analysis was conducted over the course of the next several months. These efforts led to eventual invalidation of the lithium data and subsequent transition to a different analytical laboratory (for lithium only) beginning with the October monitoring event. Also, during the May event, radium in downgradient Well BR-3-DG was reported at an atypical level approximately 10-fold higher than the historical average. Through re-sampling and split-sample analysis, the initial result was also invalidated and determined that laboratory error was most likely responsible. Further details on the lithium and radium evaluations from the May event are contained in Appendix A. The October event yielded elevated lithium levels, again encompassing the above-noted upgradient and downgradient wells plus the two remaining downgradient Wells BR-13-DG (first time detectable level of lithium) and BR-20-DG. These results are currently being further investigated within the potential context of an Alternate Source Demonstration (ASD) to determine

if laboratory issues may still be providing influence, and/or if other considerations/sources are possibly responsible. If the findings from the investigation suggest that the October lithium results do constitute a statistically significant level (SSL) above the corresponding groundwater protection standard (GWPS), then appropriate notifications will be made, and an Assessment of Corrective Measures initiated within the allowable timeframes of the CCR Rule.

Summarizing the above discussion with specific regard to the new criteria established in §257.90(e)(6), the following elements are noted:

- §257.90(e)(6)(i) – At the beginning of the current annual reporting period, the Dunkirk Landfill was operating under the CCR Assessment Monitoring Program.
- §257.90(e)(6)(ii) – At the conclusion of the current annual reporting period, the Dunkirk Landfill remained in the CCR Assessment Monitoring Program.
- §257.90(e)(6)(iii) – The following SSIs for Appendix III constituents were observed in the downgradient wells during the current annual reporting period:
  - Well BR-3-DG – calcium, chloride, fluoride, sulfate, and TDS
  - Well BR-12-DG – calcium, chloride, fluoride, and TDS
  - Well BR-13-DG – chloride and fluoride
  - Well BR-20-DG – boron, chloride, fluoride, and TDS.

  This same general subset of Appendix III constituents triggered the Dunkirk Landfill into the CCR Assessment Monitoring Program in early-2018, wherein it has since remained.
- §257.90(e)(6)(iv) – Lithium was measured above the GWPS in downgradient Wells BR-3-DG and BR-12-DG during the May 2021 monitoring event. Radium was measured above the GWPS in downgradient Well BR-3-DG also during the May 2021 event. Each of these initially reported values were subsequently invalidated and not deemed to represent an SSL for the respective constituents. Lithium was measured above the GWPS during the October 2021 monitoring event in each of the downgradient Wells BR-3-DG, BR-12-DG, BR-13-DG, and BR-20-DG. Ongoing investigation will determine if any of the lithium results constitute an SSL.
- §257.90(e)(6)(v) – The Dunkirk Landfill is not currently subject to corrective action or any associated remedy selection under §257.97.
- §257.90(e)(6)(vi) – The Dunkirk Landfill is not currently subject to corrective action or any associated remedy implementation under §257.98.

1.0 Introduction

Title 40 Code of Federal Regulations (CFR) §257.90 mandates that existing Coal Combustion Residuals (CCR) landfills and surface impoundments, also known as CCR units, be subject to groundwater monitoring and corrective action requirements as further detailed in §257.91 through §257.98. These requirements are part of the overall CCR Rule (or Rule) which was published in the Federal Register on April 17, 2015 and which became effective on October 19, 2015. Specific obligations for Owners and Operators of existing CCR units regarding the preparation of "Annual Groundwater Monitoring and Corrective Action Reports (Annual Report)" are outlined in §257.90(e)(1-5). The first Annual Report was completed on January 31, 2018, and provided information, per the Rule, to address the following aspects for the preceding calendar year:

- Document the status of the groundwater monitoring and corrective action program for the respective CCR units;
- Summarize key actions completed;
- Describe any problems encountered and actions taken to resolve the problems; and
- Offer a projection of key activities for the upcoming year.

At a minimum, the Annual Report must contain the following information to the extent applicable and available, and must also address the items contained in §257.90(e)(6) in the form of an Executive Summary:

- A map, aerial image, or diagram showing the CCR unit and all background/upgradient and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program;
- 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;
- 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/upgradient and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;
- 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
- Any other information required to be included as specified in §257.90 through §257.98.

The Dunkirk Generating Station, owned by Dunkirk Power LLC, is a coal-fired power plant located in Dunkirk, New York. The facility was decommissioned and ceased electric generating operations in early-2016, subsequent to the effective date of the Rule. The Rule applies to this facility due to the continued management/disposal of CCR materials resulting from sustained operations and maintenance activities. Accordingly, the Station's captive disposal site, located in Pomfret, New York and identified as the Dunkirk Landfill, has been designated as an existing CCR unit. This unit has a dedicated groundwater monitoring well network that meets the requirements of §257.91 with regard to number and appropriate locations of wells (certification previously provided under separate cover).

In summary, this fifth Annual Report has been prepared to comply with the requirements of §257.90(e) with respect to documenting the groundwater monitoring and corrective actions undertaken during Calendar Year 2021 for the Dunkirk Landfill CCR unit. This Annual Report and all subsequent reports thereto will be placed in the Station's operating record per §257.105(h)(1), noticed to the State Director per §257.106(h)(1), and posted to the publicly accessible internet site per §257.107(h)(1).

The previously prepared fourth Annual Report (covering the 2020 Calendar Year reporting period) was completed on January 31, 2021 and placed into the facility operating record on this same date. Subsequent notification to the State Director and posting to the publicly accessible website was completed on March 1, 2021.

2.0 Dunkirk Landfill

2.1 Groundwater Monitoring Network

The CCR groundwater monitoring system for the Dunkirk Landfill is comprised of five wells, including Well BR-14-UG (upgradient), and Wells BR-3-DG, BR-12-DG, BR-13-DG, and BR-20-DG (downgradient). The locations of the wells are shown on the attached Figure 1, along with depiction of the generalized groundwater flow direction in the area of the landfill. Each of these wells was already existing, and no new wells were added nor were any existing wells abandoned/replaced during the 2021 reporting period.

2.2 2021 Data Collection

Following its transition in early-2018, the Dunkirk Landfill continued in the CCR Assessment Monitoring Program during the 2021 reporting period. Accordingly, samples were collected and analyzed for Appendix III and Appendix IV constituents as required, during the May and October monitoring events. Results from the 2021 sampling events are summarized in Tables 1 and 2, covering Appendix III and Appendix IV constituents, respectively. As shown in Table 2, lithium in downgradient Wells BR-3-DG and BR-12-DG was measured at elevated levels of 0.119 and 0.145 mg/L, respectively, during the May event, and notably represented the first detectable levels of lithium measured in either well since inception of the CCR Monitoring Program. When coupled with a similar but more confounding elevated lithium concentration in upgradient Well BR-14-UG (also identified as the first measurable level in this well), the values collectively became suspect. Re-sampling of the wells in July 2021, followed by analysis of split samples across three separate laboratories, led to the eventual invalidation of the May lithium results and further determination that they did not constitute a statistically significant level (SSL) above the site-specific groundwater protection standard (GWPS) of 0.05 mg/L in Well BR-3-DG or Well BR-12-DG.

Also, during the May monitoring event, radium in downgradient Well BR-3-DG was measured at 8.14 pCi/L, noted as being above the GWPS of 5.0 pCi/L and approximately an order of magnitude greater than the historical average observed in this well. In conjunction with the above-noted July 2021 efforts, re-sampling for radium in Well BR-3-DG resulted in values of 0.57 and 0.71 pCi/L associated with split-sample analysis. These values align with the historical observations, and served to invalidate the original result and negated any further consideration of the May radium data as being an SSL above the GWPS. Additional details of the basis/rationale for invalidation of the lithium and radium results from the May monitoring event are provided in Appendix A.

During the October monitoring event, lithium was detected in all four of the downgradient Wells BR-3-DG (0.06 mg/L), BR-12-DG (0.07 mg/L), BR-13-DG (0.10 mg/L), and BR-20-DG (0.48

mg/L) at levels that would represent SSLs above the GWPS, unless findings derived from further ongoing evaluation and/or potential alternate source considerations indicate otherwise. Accordingly, Dunkirk Power LLC is utilizing the allowable timeframes within the CCR Rule to conduct additional investigation (in the context of a potential Alternate Source Demonstration [ASD]) for possible explanations of the potentially anomalous lithium measurements from the October event, including a repeat detection of lithium in upgradient Well BR-14-UG. Should the investigation conclude that lithium concentrations in any of the downgradient wells do represent an SSL above the site-specific GWPS, an Assessment of Corrective Measures (ACM) will be initiated, as required per §257.96(a).

2.3 2021 Monitoring Program Transitions

During 2021, there were no transitions between monitoring programs, with the Dunkirk Landfill remaining in the CCR Assessment Monitoring Program.

2.4 2021 Corrective Actions

During 2021, there were no corrective actions undertaken.

2.5 2022 Projected Activities

It is anticipated that Assessment Monitoring activities will continue for the Dunkirk Landfill during 2022, with continued review of Appendix III/Appendix IV constituent concentrations and comparison against calculated background and established groundwater protection standards. As noted above, the ongoing investigation of the potentially anomalous lithium results from the October 2021 monitoring event will continue into early-2022. In the event that results in any of the downgradient wells are determined to represent an SSL above the GWPS, appropriate notification of the SSL will be made along with notification that an ACM has been initiated. This determination will be made and accompanying actions undertaken by early-March 2022. In the event an alternative source for the anomalous data is defined, the facility will remain in Assessment Monitoring for this constituent.

Tables

Table 1
Dunkirk Power LLC
Dunkirk Landfill – Groundwater Analytical Data
CCR Appendix III Constituents

Monitoring Well	Date Sampled	Total Boron (mg/L)	Total Calcium (mg/L)	Total Chloride (mg/L)	Total Fluoride (mg/L)	Total Dissolved Solids (mg/L)	Sulfate (mg/L)	pH (S.U.)
		Calculated Background						
		0.270	135	5.1	0.22	699	254	5.79-8.38
BR-14-UG (Upgradient)	17-Nov-15	0.183	100	3.6	< 0.20	370	82	7.53
	9-Feb-16	0.200	89	3.4	< 0.20	435	78	6.56
	11-May-16	0.164	86	3.1	0.22	430	73	7.24
	30-Aug-16	0.185	87	3.6	< 0.20	470	87	6.98
	9-Nov-16	0.160	92	4.1	< 0.20	575	159	7.33
	14-Feb-17	0.175	108	4.3	< 0.20	480	133	7.17
	16-May-17	0.157	81	3.5	< 0.20	460	91	7.42
	15-Aug-17	0.228	111	3.4	0.21	505	128	6.42
	2-Oct-17	0.154	103	4.0	< 0.20	570	147	7.10
	9-May-18	0.121	80	2.5	< 0.20	385	51	7.29
	9-Oct-18	0.199	81	3.4	0.22	440	78	7.29
	11-Mar-19	0.254	97	3.0	< 0.20	465	62	7.37
	15-May-19	0.170	89	2.9	< 0.20	425	52	7.30
	1-Oct-19	0.190	91	3.5	0.23	500	95	7.31
	11-Feb-20	0.195	90	2.9	< 0.20	355	58	7.21
	13-May-20	0.164	92	2.8	< 0.20	420	67	7.38
	20-Oct-20	0.181	106	3.4	< 0.20	610	155	7.31
	11-May-21	0.158	100	3.2	0.39	565	78	7.02
	12-Oct-21	0.246	95	2.9	< 0.20	505	86	7.07
BR-3-DG (Downgradient)	17-Nov-15	0.098	141	45.9	< 0.20	545	159	7.23
	9-Feb-16	0.078	119	32.8	< 0.20	590	155	7.50
	11-May-16	0.098	111	23.0	< 0.20	560	137	7.16
	30-Aug-16	0.096	114	28.8	< 0.20	585	159	7.01
	9-Nov-16	0.088	115	84.9	< 0.20	705	152	7.13
	14-Feb-17	0.092	151	99.7	< 0.20	590	161	7.19
	16-May-17	0.062	113	58.1	< 0.20	580	150	6.55
	15-Aug-17	0.135	139	69.4	0.27	600	158	6.98
	2-Oct-17	0.095	134	77.4	0.38	700	165	7.32
	9-May-18	0.068	145	34.9	< 0.20	585	147	7.12
	8-Oct-18	0.109	106	33.5	0.22	565	155	7.24
	11-Mar-19	0.097	157	24.3	< 0.20	600	166	7.48
	15-May-19	0.125	125	19.0	< 0.20	500	153	7.03
	1-Oct-19	0.150	140	26.2	0.25	635	153	6.99
	11-Feb-20	0.137	129	19.9	< 0.20	520	163	6.93
	12-May-20	0.097	140	21.5	< 0.20	625	230	7.52
	20-Oct-20	0.091	132	25.5	< 0.20	665	191	7.32
	11-May-21	0.063	168	22.3	0.32	850	345	7.19
	12-Oct-21	0.115	155	19.9	0.48	745	275	7.31
BR-12-DG (Downgradient)	17-Nov-15	0.163	197	319	< 0.20	825	66	6.94
	9-Feb-16	0.104	177	263	< 0.20	920	151	7.00
	11-May-16	0.083	156	158	< 0.20	780	168	7.29
	30-Aug-16	0.173	166	329	< 0.20	1040	70	7.04
	9-Nov-16	0.179	222	375	< 0.20	1260	62	7.00
	14-Feb-17	0.117	241	422	< 0.20	1030	109	7.07
	16-May-17	0.068	160	299	< 0.20	1100	139	6.54
	15-Aug-17	0.181	174	299	< 0.20	1030	83	6.99
	2-Oct-17	0.163	196	421	1.04	1250	70	6.94
	9-May-18	0.061	205	260	< 0.20	950	147	6.69
	8-Oct-18	0.169	171	382	< 0.20	1120	71	6.91
	11-Mar-19	0.073	244	213	< 0.20	920	154	7.16
	15-May-19	0.066	175	188	< 0.20	945	156	6.91
	1-Oct-19	0.142	241	323	0.29	1340	85	6.91
	11-Feb-20	0.092	181	224	< 0.20	785	147	6.78
	12-May-20	0.079	179	183	< 0.20	815	194	7.05
	20-Oct-20	0.176	196	395	< 0.20	1470	67	7.09
	11-May-21	0.077	198	228	0.25	860	169	7.19
	12-Oct-21	0.165	181	285	< 0.20	855	91	6.95

See notes at end of table.

Table 1 (cont'd)
Dunkirk Power LLC
Dunkirk Landfill – Groundwater Analytical Data
CCR Appendix III Constituents

Monitoring Well	Date Sampled	Total Boron (mg/L)	Total Calcium (mg/L)	Total Chloride (mg/L)	Total Fluoride (mg/L)	Total Dissolved Solids (mg/L)	Sulfate (mg/L)	pH (S.U.)
		Calculated Background						
		0.270	135	5.1	0.22	699	254	5.79-8.38
BR-13-DG (Downgradient)	17-Nov-15	0.223	109	8.8	< 0.20	495	67	7.23
	9-Feb-16	0.162	109	7.9	< 0.20	560	129	7.25
	11-May-16	0.151	115	7.1	< 0.20	620	161	7.23
	30-Aug-16	0.304	118	8.6	< 0.20	560	59	7.09
	9-Nov-16	0.164	85	7.3	< 0.20	560	127	7.20
	14-Feb-17	0.144	113	7.6	< 0.20	545	140	7.21
	16-May-17	0.103	97	7.1	< 0.20	585	142	6.79
	15-Aug-17	0.274	103	8.4	0.21	500	60	7.03
	2-Oct-17	0.240	96	8.4	< 0.20	565	41	7.19
	9-May-18	0.109	131	6.7	< 0.20	540	108	7.05
	8-Oct-18	0.252	89	8.9	< 0.20	555	72	7.09
	11-Mar-19	0.172	126	8.2	< 0.20	545	122	7.07
	15-May-19	0.134	123	7.8	< 0.20	585	137	7.11
	1-Oct-19	0.278	94	8.7	0.26	615	29	7.13
	11-Feb-20	0.173	115	8.5	< 0.20	470	99	6.78
	12-May-20	0.153	125	7.9	< 0.20	545	159	7.21
	20-Oct-20	0.322	102	9.0	0.27	500	32	7.56
	11-May-21	0.144	120	8.3	0.38	645	118	7.19
	12-Oct-21	0.269	103	9.0	0.63	375	54	7.09
BR-20-DG (Downgradient)	17-Nov-15	1.42	26	2.8	< 0.20	670	102	7.61
	9-Feb-16	1.40	24	12.2	0.35	725	< 2.0	7.74
	11-May-16	1.44	22	33.0	0.35	720	< 2.0	7.85
	30-Aug-16	1.39	24	25.4	0.36	685	< 4.0	6.97
	9-Nov-16	1.35	19	15.5	0.22	675	< 2.0	7.69
	14-Feb-17	1.56	25	16.5	0.39	635	< 2.0	7.69
	16-May-17	1.37	21	15.5	< 0.20	675	< 2.0	7.71
	15-Aug-17	1.42	25	38.3	0.41	655	< 2.0	7.58
	2-Oct-17	1.24	22	21.6	0.42	720	< 4.0	7.32
	9-May-18	1.09	21	21.3	0.40	650	< 4.0	7.49
	8-Oct-18	1.41	21	14.9	0.39	640	< 2.0	7.58
	12-Mar-19	1.35	22	19.8	0.42	725	< 4.0	7.54
	15-May-19	1.27	24	23.7	0.33	765	< 4.0	7.71
	1-Oct-19	1.45	22	17.7	0.42	575	< 4.0	7.73
	11-Feb-20	1.47	25	28.3	< 0.20	630	< 4.0	7.73
	12-May-20	1.47	26	18.1	0.31	635	< 4.0	7.52
	20-Oct-20	1.42	25	31.0	0.44	650	< 2.0	7.92
	11-May-21	1.26	24	59.6	0.54	865	< 2.0	7.80
	12-Oct-21	1.50	26	15.5	0.85	425	< 4.0	7.51

Notes:

1. Cells with "<" are represented as non-detects. Values shown correspond to the laboratory reporting limit.
2. Background values based on statistical evaluation of initial eight rounds (Nov. 2015 through Aug. 2017) of groundwater sampling data for Well BR-14-UG.

Table 2
Dunkirk Power LLC
Dunkirk Landfill – Groundwater Analytical Data
CCR Appendix IV Constituents

Monitoring Well	Date Sampled	Total Antimony (mg/L)	Total Arsenic (mg/L)	Total Barium (mg/L)	Total Beryllium (mg/L)	Total Cadmium (mg/L)	Total Chromium (mg/L)	Total Cobalt (mg/L)	Total Fluoride (mg/L)	Total Lead (mg/L)	Total Lithium (mg/L)	Total Mercury (mg/L)	Total Molybdenum (mg/L)	Total Selenium (mg/L)	Total Thallium (mg/L)	Total Radium-226 and 228 (pCi/L)
		Calculated Background														
		0.0025	0.009	0.68	0.004	0.005	0.005	0.05	0.22	0.005	0.05	0.000001	0.01	0.005	0.0007	1.25
		Groundwater Protection Standard														
		MCL	MCL	MCL	Background	MCL	MCL	Background	MCL	RSL	Background	MCL	RSL	MCL	MCL	MCL
		0.006	0.01	2	0.004	0.005	0.1	0.05	4.0	0.015	0.05	0.002	0.10	0.05	0.002	5
BR-14-UG (Upgradient)	17-Nov-15	< 0.060	0.009	0.21	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.23
	9-Feb-16	< 0.060	< 0.005	0.33	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.24
	11-May-16	< 0.060	< 0.005	0.20	< 0.005	< 0.005	< 0.005	< 0.050	0.22	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.18
	30-Aug-16	< 0.060	0.008	0.24	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	0.0000005	< 0.010	< 0.005	< 0.010	1.25
	9-Nov-16	< 0.060	< 0.005	0.05	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.23
	14-Feb-17	< 0.060	< 0.005	0.09	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.22
	16-May-17	0.0010	< 0.005	0.11	< 0.004	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0007	0.33
	15-Aug-17	0.0025	< 0.005	0.10	< 0.004	< 0.005	< 0.005	< 0.050	0.21	< 0.005	< 0.050	< 0.0000010	< 0.010	< 0.005	< 0.0007	< 1.22
	29-Mar-18	< 0.0004	< 0.005	0.13	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.00
	9-May-18	Not Analyzed	Not Analyzed	0.12	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.29
	9-Oct-18	Not Analyzed	Not Analyzed	0.14	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.22	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.29
	11-Mar-19	< 0.0004	0.005	0.20	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.63
	15-May-19	Not Analyzed	< 0.01	0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	< 0.003	Not Analyzed	0.0000016	Not Analyzed	Not Analyzed	Not Analyzed	0.77
	1-Oct-19	Not Analyzed	< 0.005	0.12	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.23	< 0.005	Not Analyzed	0.0000007	Not Analyzed	Not Analyzed	Not Analyzed	0.43
	11-Feb-20	< 0.0004	< 0.005	0.17	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.87
	13-May-20	< 0.0004	Not Analyzed	0.18	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	< 0.050	0.0000008	Not Analyzed	Not Analyzed	Not Analyzed	1.23
	20-Oct-20	< 0.0004	Not Analyzed	0.12	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	< 0.050	0.0000006	Not Analyzed	Not Analyzed	Not Analyzed	0.76
	11-May-21	< 0.0004	< 0.005	0.18	< 0.0003	< 0.005	< 0.005	< 0.050	0.39	< 0.005	0.178	0.0000018	< 0.010	< 0.005	< 0.0003	0.11
	12-Oct-21	Not Analyzed	Not Analyzed	0.21	Not Analyzed	Not Analyzed	0.007	Not Analyzed	< 0.20	Not Analyzed	0.060	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	0.72
BR-3-DG (Downgradient)	17-Nov-15	< 0.060	0.008	0.05	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	0.006	< 0.050	< 0.0000005	< 0.010	< 0.005	0.012	0.22
	9-Feb-16	< 0.060	< 0.005	0.04	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.22
	11-May-16	< 0.060	< 0.005	0.03	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.76
	30-Aug-16	< 0.060	0.008	0.04	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	1.23
	9-Nov-16	< 0.060	< 0.005	0.03	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.28
	14-Feb-17	< 0.060	0.006	0.04	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.31
	16-May-17	0.0016	< 0.005	0.03	< 0.004	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0007	1.28
	15-Aug-17	0.0040	< 0.005	0.05	< 0.004	< 0.005	< 0.005	< 0.050	0.27	< 0.005	< 0.050	< 0.0000010	< 0.010	< 0.005	< 0.0007	1.23
	29-Mar-18	< 0.0004	< 0.005	0.04	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.00
	9-May-18	Not Analyzed	Not Analyzed	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.20
	8-Oct-18	Not Analyzed	Not Analyzed	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.22	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.58
	11-Mar-19	< 0.0004	< 0.005	0.03	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	0.006	< 0.050	0.0000030	< 0.010	< 0.005	< 0.0003	0.54
	15-May-19	Not Analyzed	< 0.01	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	< 0.003	Not Analyzed	0.0000028	Not Analyzed	Not Analyzed	Not Analyzed	3.48
	1-Oct-19	Not Analyzed	< 0.005	0.04	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.25	< 0.005	Not Analyzed	0.0000016	Not Analyzed	Not Analyzed	Not Analyzed	0.81
	11-Feb-20	< 0.0004	< 0.005	0.03	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	0.0000014	< 0.010	< 0.005	< 0.0003	1.19
	12-May-20	< 0.0004	Not Analyzed	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	< 0.050	0.0000009	Not Analyzed	Not Analyzed	Not Analyzed	0.89
	20-Oct-20	0.0007	Not Analyzed	0.03	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	< 0.050	0.0000006	Not Analyzed	Not Analyzed	Not Analyzed	0.03
	11-May-21	< 0.0004	< 0.005	0.03	< 0.0003	< 0.005	< 0.005	< 0.050	0.32	< 0.005	0.119	0.0000016	< 0.010	< 0.005	< 0.0003	0.57/0.71
	12-Oct-21	Not Analyzed	Not Analyzed	0.04	Not Analyzed	Not Analyzed	0.019	Not Analyzed	0.48	Not Analyzed	0.060	0.0000011	Not Analyzed	Not Analyzed	Not Analyzed	0.55
BR-12-DG (Downgradient)	17-Nov-15	< 0.060	0.006	0.07	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	0.014	0.35
	9-Feb-16	< 0.060	< 0.005	0.06	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.16
	11-May-16	< 0.060	< 0.005	0.04	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.31
	30-Aug-16	< 0.060	0.009	0.09	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	1.61
	9-Nov-16	< 0.060	< 0.005	0.08	< 0.005	< 0.005	0.045	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.45
	14-Feb-17	< 0.060	< 0.005	0.08	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	1.22
	16-May-17	0.0022	< 0.005	0.04	< 0.004	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0007	0.22
	15-Aug-17	0.0045	< 0.005	0.08	< 0.004	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000010	< 0.010	< 0.005	< 0.0007	0.32
	29-Mar-18	< 0.0004	< 0.005	0.05	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.00
	9-May-18	Not Analyzed	Not Analyzed	0.04	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.32
	8-Oct-18	Not Analyzed	Not Analyzed	0.07	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.67
	11-Mar-19	< 0.0004	< 0.005	0.03	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	1.16
	15-May-19	Not Analyzed	< 0.01	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	< 0.003	Not Analyzed	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	1.49
	1-Oct-19	Not Analyzed	< 0.005	0.06	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.29	< 0.005	Not Analyzed	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	0.89
	11-Feb-20	< 0.0004	< 0.005	0.05	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	1.34
	12-May-20	< 0.0004	Not Analyzed	0.04	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	< 0.050	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	0.47
	20-Oct-20	< 0.0004	Not Analyzed	0.09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	< 0.050	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	1.77
	11-May-21	< 0.0004	< 0.005	0.05	< 0.0003	< 0.005	0.007	< 0.050	0.25	< 0.005	0.145	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.79
	12-Oct-21	Not Analyzed	Not Analyzed	0.08	Not Analyzed	Not Analyzed	< 0.010	Not Analyzed	< 0.20	Not Analyzed	0.070	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	0.44

See notes at end of table.

Table 2 (cont'd)
Dunkirk Power LLC
Dunkirk Landfill – Groundwater Analytical Data
CCR Appendix IV Constituents

Monitoring Well	Date Sampled	Total Antimony (mg/L)	Total Arsenic (mg/L)	Total Barium (mg/L)	Total Beryllium (mg/L)	Total Cadmium (mg/L)	Total Chromium (mg/L)	Total Cobalt (mg/L)	Total Fluoride (mg/L)	Total Lead (mg/L)	Total Lithium (mg/L)	Total Mercury (mg/L)	Total Molybdenum (mg/L)	Total Selenium (mg/L)	Total Thallium (mg/L)	Total Radium-226 and 228 (pCi/L)
		Calculated Background														
		0.0025	0.009	0.68	0.004	0.005	0.005	0.05	0.22	0.005	0.05	0.000001	0.01	0.005	0.0007	1.25
		Groundwater Protection Standard														
		MCL	MCL	MCL	Background	MCL	MCL	Background	MCL	RSL	Background	MCL	RSL	MCL	MCL	MCL
		0.006	0.01	2	0.004	0.005	0.1	0.05	4.0	0.015	0.05	0.002	0.10	0.05	0.002	5
BR-13-DG (Downgradient)	17-Nov-15	< 0.060	< 0.005	0.08	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	0.012	0.36
	9-Feb-16	< 0.060	< 0.005	0.08	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.45
	11-May-16	< 0.060	< 0.005	0.07	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.44
	30-Aug-16	< 0.060	0.008	0.11	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	1.39
	9-Nov-16	< 0.060	< 0.005	0.05	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.33
	14-Feb-17	< 0.060	< 0.005	0.06	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.17
	16-May-17	0.0015	< 0.005	0.05	< 0.004	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0007	0.24
	15-Aug-17	0.0030	< 0.005	0.09	< 0.004	< 0.005	< 0.005	< 0.050	0.21	< 0.005	< 0.050	< 0.0000010	< 0.010	< 0.005	< 0.0007	0.34
	29-Mar-18	< 0.0004	< 0.005	0.07	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.00
	9-May-18	Not Analyzed	Not Analyzed	0.06	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.37
	8-Oct-18	Not Analyzed	Not Analyzed	0.09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	1.87
	11-Mar-19	< 0.0004	0.006	0.07	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	1.12
	15-May-19	Not Analyzed	< 0.01	< 0.20	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	< 0.003	Not Analyzed	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	1.09
	1-Oct-19	Not Analyzed	< 0.005	0.09	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.26	< 0.005	Not Analyzed	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	1.13
	11-Feb-20	< 0.0004	< 0.005	0.08	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.65
	12-May-20	< 0.0004	Not Analyzed	0.08	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	< 0.20	Not Analyzed	< 0.050	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	1.18
	20-Oct-20	< 0.0004	Not Analyzed	0.10	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.27	Not Analyzed	< 0.050	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	1.21
	11-May-21	< 0.0004	< 0.005	0.07	< 0.0003	< 0.005	0.007	< 0.050	0.38	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	0.34
	12-Oct-21	Not Analyzed	Not Analyzed	0.08	Not Analyzed	Not Analyzed	< 0.010	Not Analyzed	0.63	Not Analyzed	0.100	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	0.48
BR-20-DG (Downgradient)	17-Nov-15	< 0.060	0.006	1.50	< 0.005	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	1.53
	9-Feb-16	< 0.060	< 0.005	1.83	< 0.005	< 0.005	< 0.005	< 0.050	0.35	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	1.71
	11-May-16	< 0.060	< 0.005	1.57	< 0.005	< 0.005	0.006	< 0.050	0.35	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	2.13
	30-Aug-16	< 0.060	0.006	1.93	< 0.005	< 0.005	< 0.005	< 0.050	0.36	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	2.04
	9-Nov-16	< 0.060	< 0.005	1.25	< 0.005	< 0.005	< 0.005	< 0.050	0.22	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	0.61
	14-Feb-17	< 0.060	< 0.005	1.88	< 0.005	< 0.005	< 0.005	< 0.050	0.39	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.010	2.20
	16-May-17	0.0014	< 0.005	1.53	< 0.004	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0007	0.99
	15-Aug-17	0.0016	< 0.005	1.84	< 0.004	< 0.005	< 0.005	< 0.050	0.41	< 0.005	< 0.050	< 0.0000010	< 0.010	< 0.005	< 0.0007	0.77
	29-Mar-18	< 0.0004	< 0.005	2.00	< 0.0003	< 0.005	< 0.005	< 0.050	0.36	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	2.01
	9-May-18	Not Analyzed	Not Analyzed	1.51	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.40	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	2.02
	8-Oct-18	Not Analyzed	Not Analyzed	1.58	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.39	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.87
	12-Mar-19	< 0.0004	< 0.005	1.51	< 0.0003	< 0.005	< 0.005	< 0.050	0.42	< 0.005	< 0.050	< 0.0000005	< 0.010	< 0.005	< 0.0003	1.24
	15-May-19	Not Analyzed	< 0.01	1.60	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.33	< 0.003	Not Analyzed	0.0000008	Not Analyzed	Not Analyzed	Not Analyzed	1.89
	1-Oct-19	Not Analyzed	< 0.005	1.38	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.42	< 0.005	Not Analyzed	0.0000008	Not Analyzed	Not Analyzed	Not Analyzed	1.22
	11-Feb-20	0.0004	< 0.005	1.84	< 0.0003	< 0.005	< 0.005	< 0.050	< 0.20	< 0.005	0.139	< 0.0000005	< 0.010	< 0.005	< 0.0003	1.43
	12-May-20	0.0005	Not Analyzed	1.95	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.31	Not Analyzed	0.266	0.0000024	Not Analyzed	Not Analyzed	Not Analyzed	1.07
	20-Oct-20	< 0.0004	Not Analyzed	1.99	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	0.44	Not Analyzed	< 0.050	< 0.0000005	Not Analyzed	Not Analyzed	Not Analyzed	2.33
	11-May-21	< 0.0004	< 0.005	1.66	< 0.0003	< 0.005	< 0.005	< 0.050	0.54	< 0.005	< 0.050	0.0000015	< 0.010	< 0.005	< 0.0003	1.80
	12-Oct-21	Not Analyzed	Not Analyzed	2.0	Not Analyzed	Not Analyzed	0.007	Not Analyzed	0.85	Not Analyzed	0.480	0.0000006	Not Analyzed	Not Analyzed	Not Analyzed	1.74

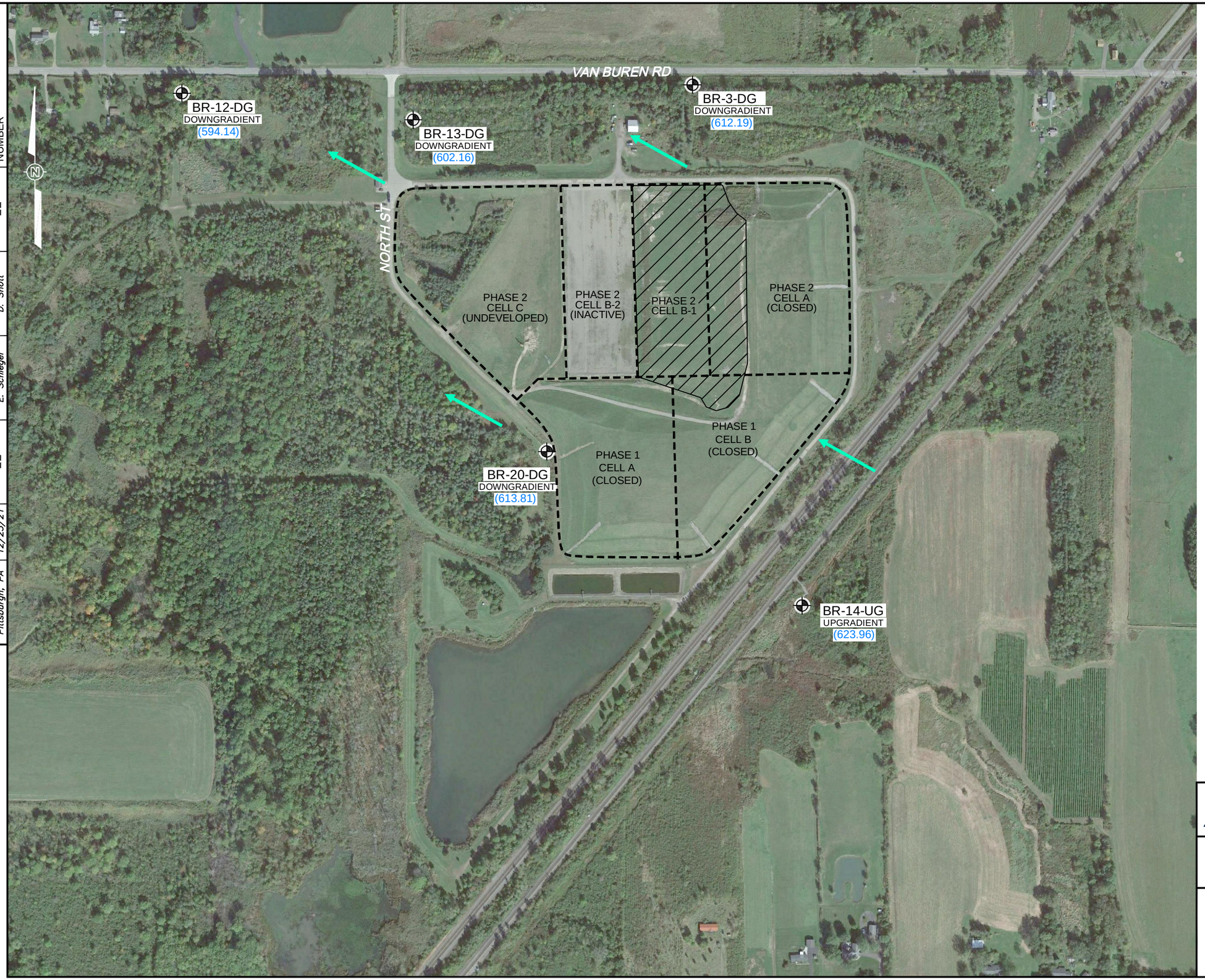
= Result from April 10, 2019 re-analysis; prior result from March 11, 2019 sample considered an atypical value (0.339 mg/L). April 2019 re-analysis result (< 0.050 mg/L) deemed representative and consistent with historical values for this well.
= Results from July 22, 2021 re-sampling and analysis of split samples; prior result from May 11, 2021 sample considered an atypical value (8.14 pCi/L). July 2021 re-sampling and split analysis results (0.57/0.71 pCi/L) deemed representative and consistent with historical values for this well.
= Results deemed invalid based on July 2021 re-sampling and split sample analysis. See Appendix A of the 2021 CCR Annual Groundwater Monitoring & Corrective Action Report (dated January 2022).
= Results addressed via peformance of Alternate Source Demonstration. See Appendix A of the 2020 CCR Annual Groundwater Monitoring & Corrective Action Report (dated January 2021).
= Results currently under investigation, pending determination of possible SSL no later than March 2022.

Notes:
1. Cells with "<" are represented as non-detects. Values shown correspond to the laboratory reporting limit.
2. Background values based on statistical evaluation of initial eight rounds (Nov. 2015 through Aug. 2017) of groundwater sampling data for Well BR-14-UG.
3. As indicated, Groundwater Protection Standards are either published MCLs or risk-based Regional Screening Levels (RSLs). For constituents where calculated background exceeds either the MCL or RSL, the background value is used.

Figures

DRAWING NUMBER	APPROVED BY	CHECKED BY	DRAWN BY	DESIGNED BY	DATE
631016538-B3	--	D. Shott	E. Schlegel	--	12/23/21

OFFICE: Pittsburgh, PA



LEGEND:

- BR-20-DG (613.81) — CCR GROUNDWATER MONITORING WELL WITH GROUNDWATER ELEVATION MEASURED ON OCTOBER 11, 2021
- ACTIVE AREAS
- GROUNDWATER GENERALIZED FLOW DIRECTION

REFERENCE:

GOOGLE AERIAL PHOTOGRAPH, DATED 10/8/2019.

SCALE

0 400 800 FEET

APTIM
500 Penn Center Boulevard,
Suite 1000
Pittsburgh, Pennsylvania 15235

DUNKIRK POWER LLC

FIGURE 1
CCR COMPLIANCE GROUNDWATER MONITORING WELL LOCATION MAP
DUNKIRK LANDFILL
DUNKIRK GENERATING STATION
DUNKIRK, NEW YORK

File: O:\PROJECT\NRG DUNKIRK\631016538\631016538-B3.dwg
Plot Date/Time: Dec 23, 2021 - 6:23am
Plotted By: Greg.Jones
Xref:
Image

Appendix A

Invalidation of Lithium/Radium Data (May 2021 Sampling Event)

2nd QTR 2021 CCR Assessment Monitoring – Invalidation of Lithium/Radium Data
Dunkirk Generating Station—Dunkirk Power LLC
Dunkirk Landfill
Dunkirk, New York

Relative to the ongoing CCR Assessment Monitoring Program (per 40 CFR 257.95) for the Dunkirk Landfill, the results from the May 11, 2021 semi-annual sampling event (received on June 28, 2021) showed a potentially anomalous value for radium in one of the downgradient wells (Well BR-3-DG) along with potentially suspect values for lithium in two downgradient wells (Wells BR-3-DG and BR-12-DG). In addition, the upgradient well (Well BR-14-UG) that has served to provide the basis for statistically derived background concentrations for the CCR monitoring activities, was also reported with a measurable lithium level for the first time in its CCR-sampling history (dating back to late-2015). As a means of further determining the validity of the results, a follow-up round of sampling was conducted on July 22, 2021, which incorporated the analysis of split samples for lithium at two separate facilities, including the current laboratory (Adirondack Environmental Services [AES]) and a supplemental laboratory (ALS Environmental [ALS]). Split samples for radium were also analyzed at Pace Analytical, the common facility utilized by both Frontier Technical Associates and ALS.

The radium results from the July re-sampling showed reasonable agreement between the split samples, and a return to typically observed levels in Well BR-3-DG below the corresponding site-specific CCR Groundwater Protection Standard (GWPS) (5.0 pCi/L).

Comparison of the July 2021 lithium results indicated an average four-fold difference between the values reported by AES versus those reported by ALS. Conversely, the data from ALS showed lithium concentrations at or just slightly above the corresponding CCR GWPS (0.05 mg/L) in downgradient Wells BR-3-DG and BR-12-DG. The ALS data was also flagged with a "J" qualifier to indicate estimated values since they fell between the Method Detection Limit (MDL) and the laboratory Reporting Limit (MRL).

Upon further examination and inquiry, it was learned that performance of the underlying analytical method for lithium (EPA Method 200.7) was slightly different between the AES and ALS laboratories. This difference constitutes the wavelengths monitored for the lithium-specific atomic emission spectral lines, with AES using a wavelength of 631.36 nanometers (nm) and ALS using a wavelength of 670.78 nm. This latter wavelength is specifically cited in Method 200.7, although allowances are noted for the use of an alternate wavelength in order to compensate for spectral interferences. Building on this information, remaining undigested aliquots from the July 2021 re-sampling were obtained from AES and submitted to a third independent laboratory (Geochemical Testing), which also uses the cited 670.78 nm wavelength for lithium analysis. These results, reported on September 22, 2021, were in almost complete agreement with the ALS values, and showed lithium concentrations at or very near the CCR GWPS for downgradient Wells BR-3-DG and BR-12-DG.

Based on the summary presented above, the May 2021 CCR Assessment Monitoring results for radium in Well BR-3-DG and lithium in Wells BR-3-DG and BR-12-DG have been deemed invalid and not representative of Statistically Significant Levels (SSLs) above the respective site-specific GWPSs. Discussion in this context and presentation of alternate confirmatory data will

be contained in the forthcoming Annual Groundwater Monitoring and Corrective Action Report to be prepared in January 2022. In further consideration of the above and effective with the next semi-annual sampling event (scheduled for October 2021), a transition will be made for utilization of ALS and/or Geochemical Testing to provide lithium analytical services under the CCR Assessment Monitoring Program.

PROFESSIONAL ENGINEER'S CERTIFICATION

Certified by: _____

Date: 9/23/21

David M. Harty. P.E.
Professional Engineer Registration No. 060830
Frontier Technical Associates, Inc.

Professional Seal: